

Manual

for RS232 Link and parallel Link

S 8 Range

S8 Classic

S8 Master

S8 IP65

S8 Contrast

Mailjet Classic



A20740-B0

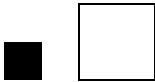
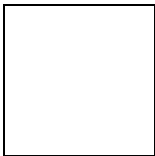


A DOVER COMPANY

General		1
Lists of the V24 commands		23
Sendings to the printer		29
Requests to the printer		61
Precise details about the data bytes		87
Examples of message programming		101
Parallel link - Presentation		111
Parallel link - Selection of messages		117

Contents

1	Introduction	2
2	Description of the signals used	3
2.1	Reference (GND)	3
2.2	DSR (Data Set Ready) in voltage levels transmission or DSR + and DSR - in loop transmission or optocoupled input.	3
2.3	DTR (Data Terminal Ready) in voltage levels transmission	3
2.4	RTS (Request To Send)	3
2.5	CTS (Clear To Send)	3
2.6	TXD (Transmit Data) in voltage levels transmission or TTY OUT + and TTY OUT - in loop transmission	3
2.7	RXD (Receive Data) in voltage levels transmission or TTY IN + and TTY IN - in loop transmission	3
3	Electrical specifications	4
4	Timing diagram	4
5	General principle of a V24 exchange	5
5.1	Identification (1 byte hexadecimal)	6
5.2	Length (2 bytes in hexadecimal)	6
5.3	Data	6
5.4	Control byte (Checksum)	6
5.5	Memory aid	7
6	Materiel configuration	8
6.1	Presentation of the terminal block of the Industrial Interface	8
6.2	Configuration of the jumpers on the Industrial Interface board	9
6.3	Presentation of the different modes	10
6.4	Suggested connection diagrams	10
7	Classic printers	13
7.1	Printer programming	13
7.2	Performances: Classic printers	15
8	S8 Master - S8 IP65 - S8 Contrast printers	17
8.1	Printer programming	17
8.2	Performances : Standard mode S8 Master, S8 IP65, S8 Contrast printers	20
8.3	Typical performance depending on the protocol mode used.	22



1 Introduction

The present manual is purposed for S8 Classic, Mailjet Classic, S8 Master, S8 IP65 and S8 Contrast printers. These printers are equipped with an asynchronous series, half duplex, interface, for connection to a V24 mode, "Voltage levels". "Current loop" transmission is only available on Classic printers.

REMINDER	"20mA loop" transmission affords good immunity against electric and electromagnetic interference. It is therefore particularly recommended for long distance connections or in a highly parasitic area.
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The RS232C (or V24) standard describes the signals available during a dialog between a DTE (Data Terminal Equipment) and a DCE (Data Communication Equipment).

A maximum of 7 signals only are used for connection to a printer, whether for "voltage level" or "loop" transmission.

NOTE	The printer should be considered as DTE.
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WARNING	Do not use the keyboard to make any changes to the printer during a V24 dialogue (risk of conflicts). You are also recommended to leave the Master, IP65 and Contrast printers in the "MAIN MENU" during a V24 dialogue.
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RS422/RS232 converter option (only available on Master, IP65 and Contrast).

If the controller uses RS422 or RS485 format communication signals, an optional board converts them to the RS232 format required by the printer.

If this board is used, the RS232 terminal blocks on the industrial interface may not be used. This board connects to the industrial interface board in place of units U1 and U2. It is compatible with software versions A41 and D73 or higher.

2 Description of the signals used

2.1 Reference (GND)

Computer and printer earth in common.

2.2 DSR (Data Set Ready) in voltage levels transmission or DSR + and DSR - in loop transmission or optocoupled input.

A printer input. This signal activates the V24 mode.

A symbol appears on the screen when the DSR signal is active.

 on Classic or  on Master, IP65 and Contrast.

2.3 DTR (Data Terminal Ready) in voltage levels transmission

A printer output. The signal is active as soon as the printer is ready to dialog.

2.4 RTS (Request To Send)

A printer output (on Classic only).

The signal is active at every character sequence sent by the printer.

2.5 CTS (Clear To Send)

A printer input (on Classic only).

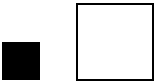
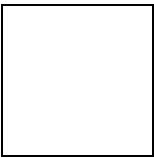
The signal instructs the printer to send.

2.6 TXD (Transmit Data) in voltage levels transmission or TTY OUT + and TTY OUT - in loop transmission

A printer output. Data transmission.

2.7 RXD (Receive Data) in voltage levels transmission or TTY IN + and TTY IN - in loop transmission

A printer input. Data reception.

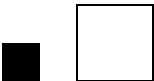


3 Electrical specifications

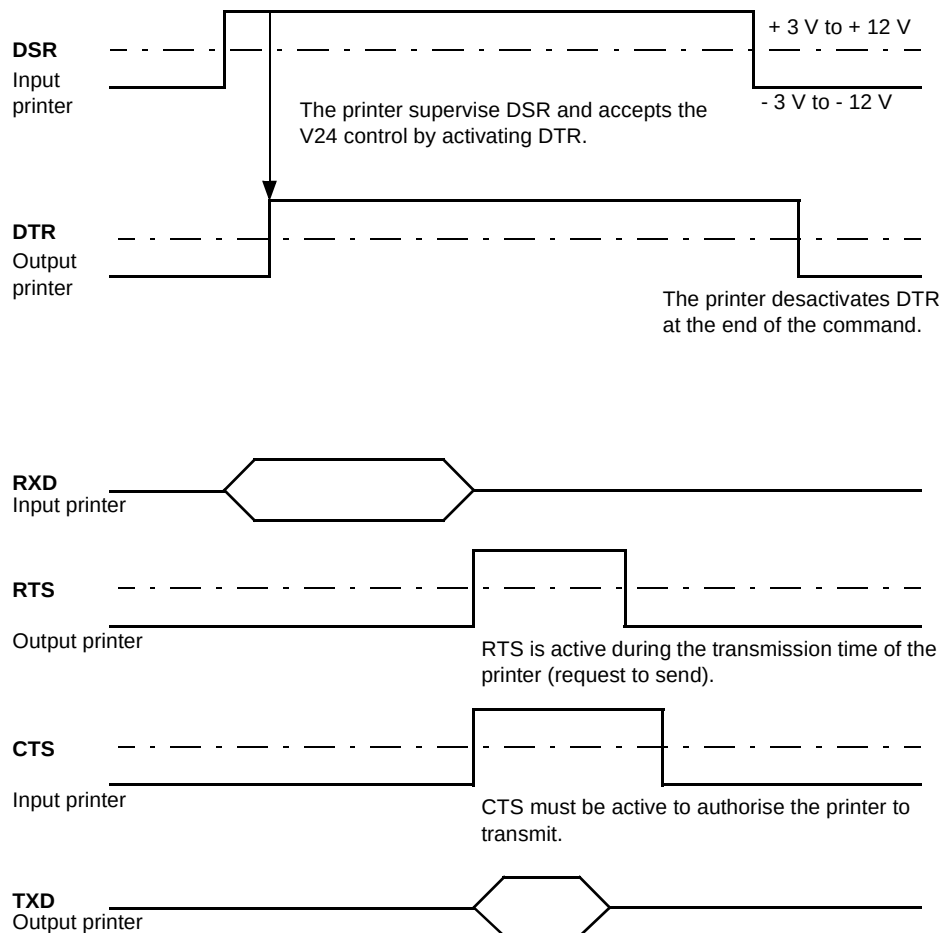
These are of V24, RS232C.

The input verification signals (DSR, CTS, RXD) are active when their voltage level is between +3 V and +12 V and inactive between -3 V and -12 V.

The output verification (DTR, RTS, TXD) are active at a voltage of 9 V and inactive at a voltage of -9 V.

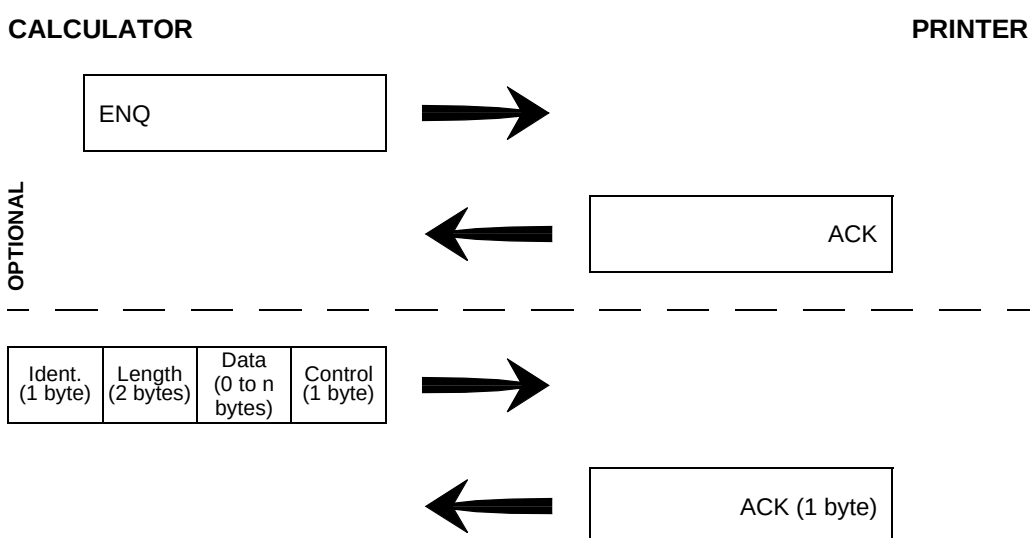


4 Timing diagram

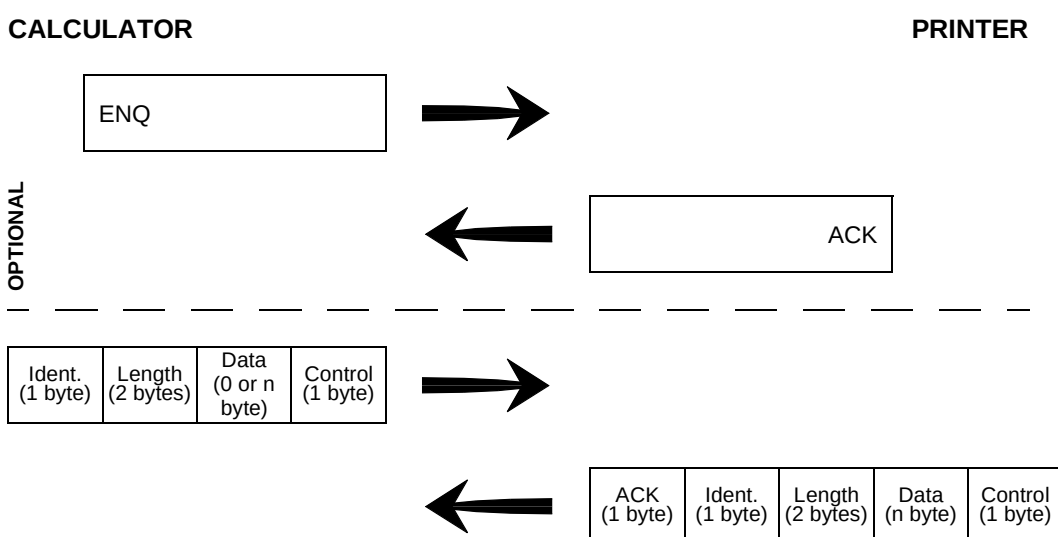


5 General principle of a V24 exchange

- Data sending from the computer to the printer.

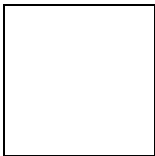


- Data request from the computer to the printer.



NOTE

All the coded data on several bytes should be transmitted, the high-order byte first.
All the bytes should be transmitted, the least significant bit first.



5.1 Identification (1 byte hexadecimal)

Specific for each command.

5.2 Length (2 bytes in hexadecimal)

The length is the number of bytes comprised between the length and the checksum byte.

5.3 Data

Zero byte in case of request from the calculator to the printer.

1 byte precised the jet number in case of a request concerning a jet.

n bytes following one byte precising the jet number in case of a sent concerning a jet.

n bytes without precising the jet number in case of a sent concerning the printer in general.

5.4 Control byte (Checksum)

This represents an "OR" exclusive of all preceding bytes (identification, length and data bytes).

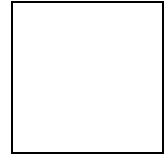
Table of the "exclusive OR" Boolean function used for the checksum.

X	Y	Result
0	0	0
0	1	1
1	0	1
1	1	0

Example of checksum calculation for two bytes:

- Value: 15 h in binary	00010101
- Value: 56 h in binary	01010110
Result	01000011

Or, in hexadecimal = 43 h



5.5 Memory aid

Conversion binary, decimal, hexadecimal.

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

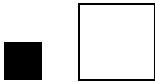
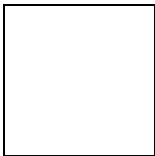
7	6	5	4	3	2	1	0
0	0	1	1	1	0	1	0
3				A			

i.e. 3Ah

A byte (8 bits) is a suite of two hexadecimal numbers.

The "h" symbol signifies hexadecimal notation.

The ASCII norm allows the association of an alphanumerical symbol with each byte.



6 Materiel configuration

6.1 Presentation of the terminal block of the Industrial Interface

To have access to the Industrial Interface card, unscrew the two fixing screws of its compartment housing at the rear of the printer.

Pass the connecting cable through one of the grommets and fix the wires to the corresponding terminals (see Figure 1).

NOTE	The connecting cable shield used should be connected to the periphery of the metallic stuffing box of the printer and the same type of connection should be made on the computer.
-------------	--

Figure 1 : Wiring of the V24 connection on B1 terminal block

1	TTYOUT-		Photocoupler output		20 mA current loop Factory set
2	TTYOUT+				
3	TTYIN-		Photocoupler input		RS232C link
4	TTYIN+				
5	-TXDOUT		Transmit data		
6	RTSOUT		Request to send		
7	DTROUT		Data Terminal ready		
8	-RXDIN		Receive data		
9	CTSIN		Clear to send		
10	DSRIN		Data send ready		
11	DSR-				
12	DSR+		Photocoupler DSR input		
13	GND		0 V		
14	SPROG 2				
15	COMSPROG				
16	SPROG 1				
17	COMRAZC 1				
18	RAZC1				
19	COMRAZC 2				
20	RAZC2				
21	RESET-				
22	RESET+				
23	-DSR422-				
24	-DSR422+				
25	RXD422-				
26	RXD422+				
27	RXC422-				
28	RXC422+				
29	VALID422-				
30	VALID400+				
31	-DTR422-				
32	-DTR422+				
33	TXD422-				
34	TXD422+				
35	TXC422-				
36	TXC422+				
37	GND				
38	+ 5 V				
39	+ 15 V				
40	- 15 V				

6.2 Configuration of the jumpers on the Industrial Interface board

The jumpers on the Industrial Interface board allow configuration of the serial connection.

NOTE

**If the computer is configured in active the printer must be configured in passive on the corresponding line and vice versa.
Current loop transmission is only available on Classic printers.**

- **RXD allows selection of the transmission mode**
 - Position 232: voltage levels transmission.
 - Position 20 mA: loop transmission.
- **SW1 used only in "loop" transmission**
 - Position active: active transmission.
 - Position passive: passive transmission.
- **SW2 used only in "loop" transmission**
 - Position active: active reception.
 - Position passive: passive reception.
- **CTS**
 - Position DSR: the printer will only transmit data if the computer gives instructions to send (DSR active) (CTS linked to DSR).
 - Position CTS: the printer will only transmit data if the computer activates the CTS.
 - Position GND: the printer can transmit continually (CTS linked to 0 V).
 - Position RTS: the printer can transmit continually (CTS linked to RTS).

Figure 1 : Location of jumpers on the Industrial Interface Card.

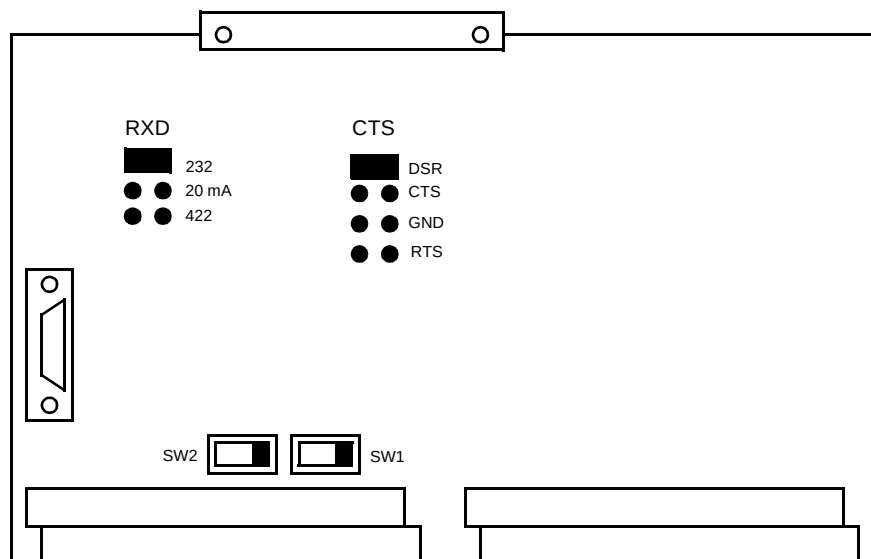
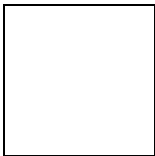


Figure 1



6.3 Presentation of the different modes

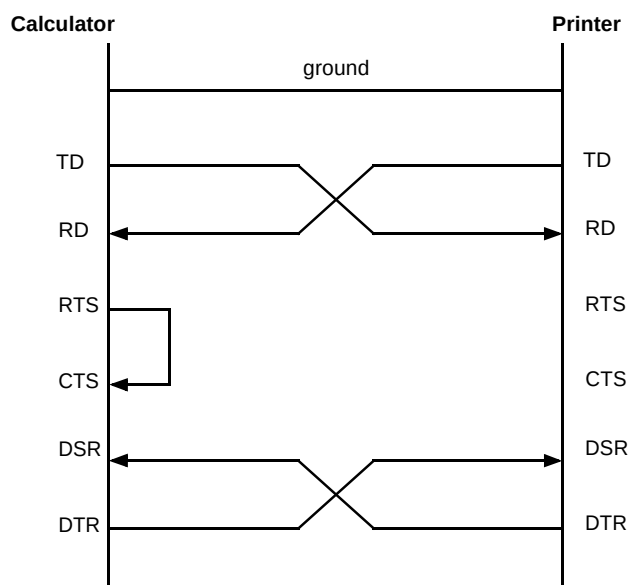
- **Slave:**
In this mode the computer alone can initialize a dialog and instruct the printer to send.
- **Complete dialog:**
In this mode both the computer and printer can initialize a dialog.
There is a check of the printer transmission.

NOTE The printer dialogue is not permitted until after the start-up phase.
In general, control by the computer of the DTR signal from the printer ensures that the latter is ready to dialog.

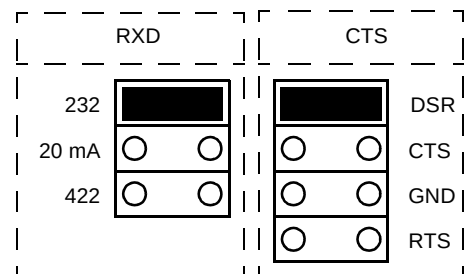
6.4 Suggested connection diagrams

6.4.1 Slave. Voltage transmission

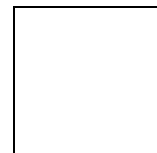
WIRING DIAGRAM



LOCATION OF JUMPERS

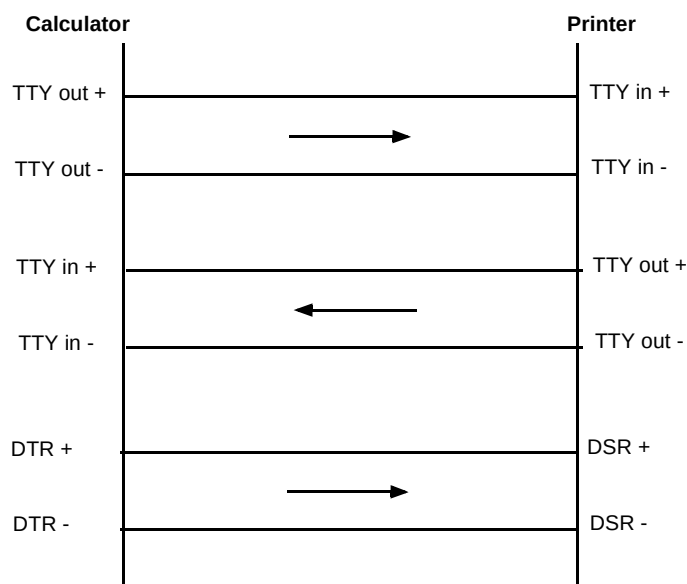


CTS
position DSR

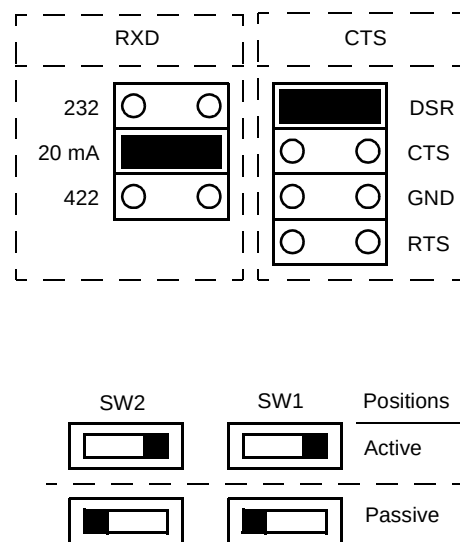


6.4.2 Slave. Loop transmission

WIRING DIAGRAM



LOCATION OF JUMPERS



NOTE

The time between the appearance of the DSR signal (on the printer) and the activation of the DTR may be as much as 100 ms. In slave mode it is therefore necessary to take the response time into account automatically and to allow for a minimum time of 100 ms (see timing diagram, page 4).

REMINDER

The printer dialogue is not permitted until after the start-up phase.

NOTE

Current loop transmission is only available on Classic printers. The value of 20 mA is preset in the factory.

6.4.3

Calculator



RXD		CTS



CTS

232

20 mA

422

DSR

CTS

GND |

RTS |

NOTE

RTS and CTS signals are only handled on Classic printers.

7 Classic printers (S8 Classic and Mailjet Classic)

7.1 Printer programming

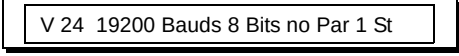
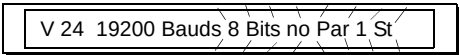
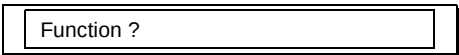
The transmission speed, format and value of the watchdog are programmable from the printer

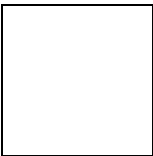
keyboard in:  

7.1.1 Transmission speed and format

Speeds available (in bauds) : 600 - 1200 - 3600 - 4800 - 7200 - 9600 - 14400 - 19200 - 38400

Warning : In "current loop" transmission, the transmission speed is restricted to 19200 baud maximum.

Press	Display	Remarks
		For access to programmable parameters
		
		To be able to adjust the transmission speed (speed flashes)
		To reduce or increase transmission speed
		To be able to modify the format (format flashes)
		To modify the format
		
		For validation
		



Formats available:

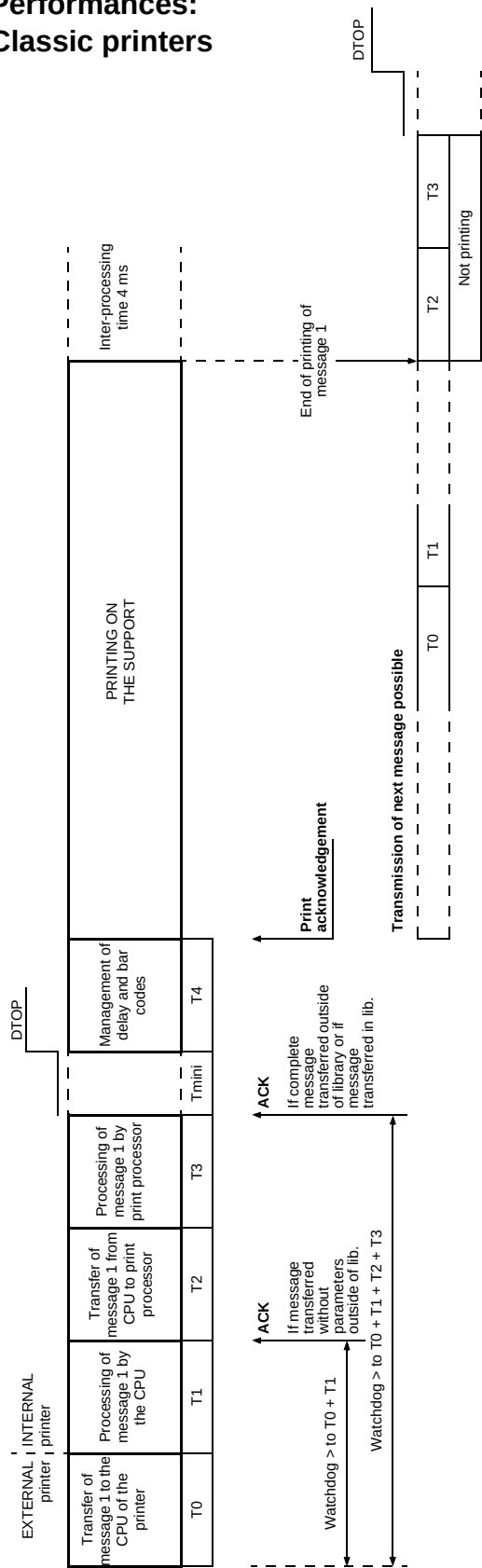
- 8 Bits no Par. 1 St (8 bits without parity 1 Stop)
- 8 Bits no Par. 2 St (8 bits without parity 2 Stop)
- 8 Bits even Parity (8 bits with pair parity)

7.1.2 Watchdog

The watchdog is a value in tens of milliseconds representing a certain time above which the printer abandons a command if it has not received a complete command sequence from the calculator.

Press	Displays	Remarks
		For access to programmable parameters.
		For access to watchdog value.
		To be able to modify the value (the value can be modified using the numeric keypad from 0001 to 9999).
		For validation.

7.2 Performances:
Classic printers



$$T0 = \frac{\text{Nbr of bytes transmitted} \times \text{Nbr of bits per byte transmitted (10 or 11)}}{\text{Transmission speed}}$$
 in seconds

$$T1 = 0.0001 \times \text{Nbr of bytes transmitted in seconds.}$$

If the message is complete:

$$T2 = \left(\frac{37 \times 0.0001}{\text{message parameters.}} \right) + (0.0001 \times \text{Nbr of bytes transmitted})$$
 in seconds

If the message is not complete: (no parameters sent)

$$T2 = 0.0001 \times \text{Nbr of bytes transmitted in seconds.}$$

$$T3 = (0.0001 \times \text{Nbr of bytes transmitted})$$
 in seconds.

$$T4 = \text{delay: from 0.5 ms to 1 ms if the print processor receives the time at this moment.}$$

Bar code: up to 9 ms depending on the bar code.

Watchdog:

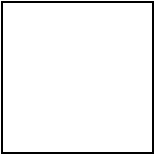
- Greater than T0+T1 if message transferred without parameters outside of lib.
- Greater than T0+T1+T2+T3 if complete message transferred outside of library or if message transferred in lib.

Sending of the printing acknowledgement:

- 1 ms minimum (see T4)
- 10 ms maximum after the end of the previous communication.

Transmission of next message:

- It is possible to transfer a new message as soon as the acknowledgement of receipt has been received by the calculator.
- It is not possible to transfer a message from the CPU to the print processor (T2) until after the previous message has been printed.



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8 Master - IP65 - Contrast printers

8.1 Printer programming

The transmission speed, format and watchdog value can be programmed in the **PRINTER PREPARATION, Initialization, RS232 connection** menu.

The following dialog box is displayed:

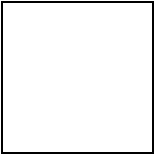
SB ON PRINTER PREPARATION MENU	
Initialization	Parameters Options Access codes
Speed (baud rate) : 38400 Parity : NO Stop bit(s) : 1 Watchdog (s) : 3 8 bit format RS232 Link : STANDARD Simple Protocol : NO	
RS232 Connection parameters	
↑ ↓ to select, SPACE to capture, ENTER / ESC to quit	

The following parameters may be set:

- Transmission speed (in baud): 4800 - 9600 - 19200 - or 38400.
- Parity: none, even, or odd.
- Number of stop bits: 1 or 2.
- Watchdog value (in seconds): 1 to 99.
- Fixed format, 8 bits: (not adjustable).
- RS232 link: Direct, standard or Test.
- Simple protocol: None, Message selection, or External Variables.

ATTENTION

Using the printer keyboard during V24 exchanges may slow transmission or cause conflicts. We highly recommend locking out access to the keyboard during the communication process using the V24 commands provided.



8.1.1 RS232 link

- **Direct:**

The operator interface sends V24 commands to the CPU without processing them.
This is the quickest mode of operation

In the PRODUCTION menu:

The current message is not displayed.

Message names are replaced by asterisks (*).

The PC interface is not updated.

- **Standard:**

The operator interface takes into account V24 commands on their way to the CPU. The processing time is 80ms minimum.

In the PRODUCTION menu:

Pressing 1 or 2 displays the current message on head 1 or 2.

The message name varies to match the current message.

- **Test:**

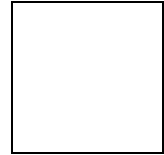
This mode of operation is not recommended for applications where the message changes regularly.

Processing time to display message (3 to 10 s).

In the PRODUCTION menu:

All messages sent or selected by V24 are automatically displayed.

The message name also changes to match the external selection.



8.1.2 Simple protocol

- **None:**

Only the conventional protocol is used for external communication
(Identifier - length - data - check byte)

- **Message selection:**

In addition to the conventional protocol, the name of a message may be transmitted in a simplified protocol to select it for printing.

Format: STX (02h) / Message name (maximum 8 characters) / ETX (03h)

- This command only addresses head 1 of the printer.
- It should preferably be used without a library.
- Messages may be selected from all those stored in the interface.

- **External variables:**

In addition to the conventional protocol, the contents of external variables may be transmitted in a simplified protocol to update the message printed.

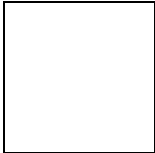
Format: STX (02h) / Variable1, Variable 2, ... (in ASCII) / ETX (03h)

- This command only addresses head 1 of the printer.
- The number of characters sent must be equal to the total number of characters reserved in all external fields in the message.
- Variable values are sent in turn, in the order of their respective fields in the message to be printed, from jet 1 to jet n.
- If an external variable is declared in a bar code with plain text transcription, the frame value must be sent together with the plain text value. In this case the variable is sent twice, at the reserved locations.

Example: STX (02h) / Variable 1, Variable 1 / ETX (03h).

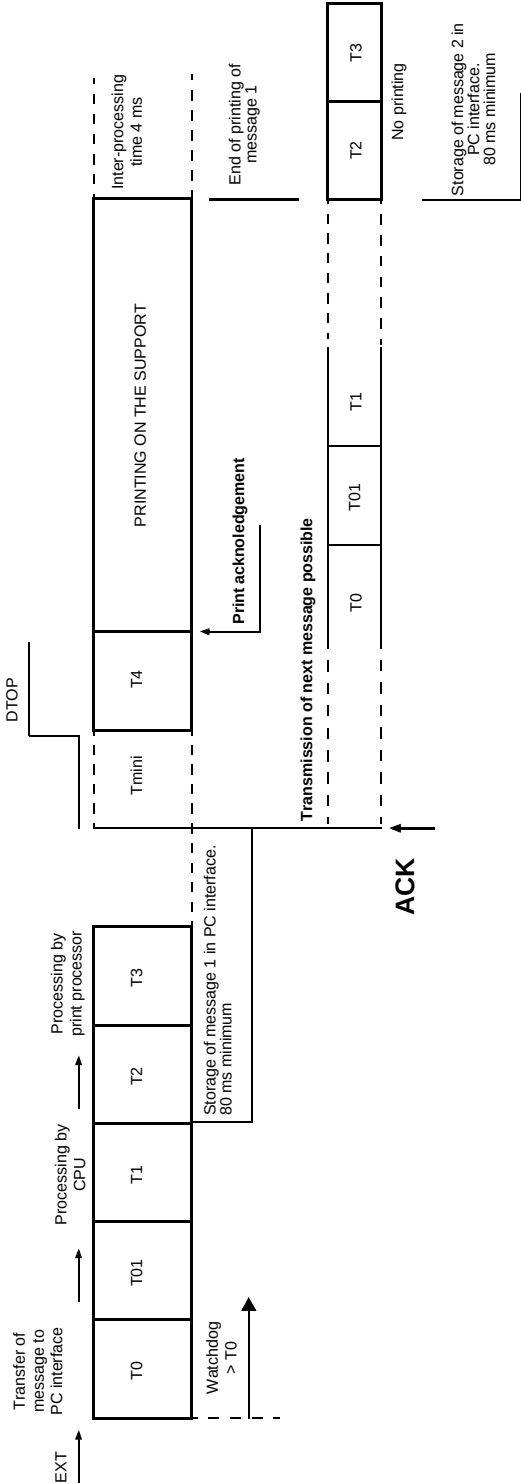
ATTENTION

- **The update affects all jets for the current message, on head 1 only.**
 - **The message must be selected manually on the operator interface, not by external communication.**
 - **The maximum size of variables is 1022 characters.**
 - **No checks are made on variable values.**
Users must ensure that the content is consistent with the fields reserved in the message to be printed.
 - **If the list of variables is incomplete or empty, it is completed with spaces.**
 - **If the list is too long it is truncated.**
-

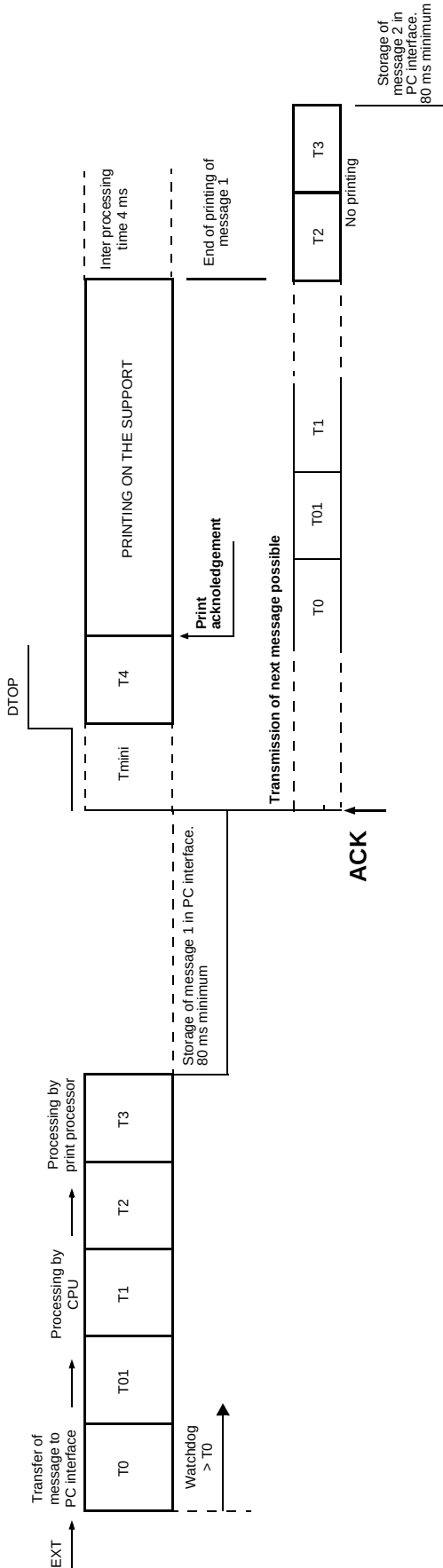


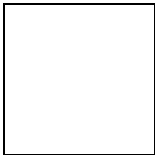
8.2 Performances : Standard mode
Master, IP65, Contrast printers

If message transferred without parameters outside of library



If complete message transferred outside of library or if message transferred in library





Transfer of message to PC interface

$$T0 = \frac{\text{ber of bytes transmitted} \times \text{number of bits per byte transmitted (10 or 11)}}{\text{Transmission speed}} \text{ in seconds}$$

Transfer of message to CPU

$$T01 = \frac{\text{Number of bytes transmitted} \times 10}{38\,400}$$

Message processing by CPU

$$T1 = 0.0001 \times \text{Number of bytes transmitted, in seconds.}$$

Transfer of message from CPU to print processor

If message complete:

$$T2 = \frac{(37 \times 0.0001) + (0.0001 \times \text{Number of bytes transmitted})}{\text{message parameter}} \text{ in seconds}$$

If message not complete: (no parameters transmitted)

$$T2 = 0.0001 \times \text{Number of bytes transmitted, in seconds.}$$

Message processing by print processor

$$T3 = (0.0001 \times \text{Number of bytes transmitted}), \text{ in seconds.}$$

Management of delay and bar code

$$T4 = \text{delay, from 0.5 ms to 1 ms, if the print processor receives the time at this moment bar code: up to 9 ms depending on the bar code.}$$

Watchdog

- Greater than T0

Sending of print acknowledgement:

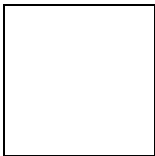
- 1 ms minimum (see T4)
- 10 ms maximum after the end of the previous communication

Storage of message in PC interface:

- Storage lasts at least 80 ms. The ACK is sent at the end of the operation.

Sending of next message:

- A new message may be sent once the storage of the previous message is complete.
- The message may only be transferred from the CPU to the print processor (T2) after the previous message has been printed.



8.3 Typical performance depending on the protocol mode used.

- Context of tests
 - Printer: 1.1G
 - Serial link parameters: Speed: 38400 baud - No parity - 1 stop bit
 - Message: Single line, 16 dots: text + 10-character external variable

“S8Master – S8IP65 – S8Contrast XXXXXXXXXXXX”

8.3.1 CONVENTIONAL PROTOCOL: (Identifier / Length / data / Check byte)

Sending of message described above

Mode	Response time
Direct	data 22 ms
	data + ACK 53 ms
Standard	data 22 ms
	data + ACK 110 ms
Test (Production menu)	data 22 ms
	data + ACK 2900 ms

8.3.2 SIMPLE PROTOCOL: (Only used to send to head 1 of printer)

- **"Message Selection" mode:** STX (02h) / Message name / ETX (03h)

Selection of message described above

Mode	Response time
Message selection	data 1.3 ms
	data + ACK 138 ms

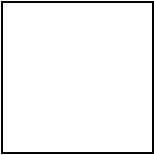
- **"External variables" mode:** STX (02h) / Variables / ETX (03h)

Sending of variable data into reserved field, in message described above

Mode	Response time
External variables	data 3.7 ms
	data + ACK 7.5 ms

Contents

1	General list of V24 commands	25
2	List of sendings to the printer	26
3	List of requests to the printer	27



Lists of the V24 commands

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1 General list of V24 commands

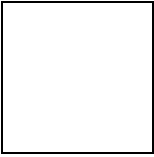
Ident.	Title of the command	Page
05h	Request for V24 dialog	62
0Ah	Sending of a message content (printer without library)	45
0Bh	Sending of message parameters (printer without library)	44
0Ch	Sending of a complete message (printer without library)	43
0Fh	Enable/disable the keyboard with DSR active	33
1Ah	Sending of a message content in library	48
1Bh	Sending of message parameters in library	47
1Ch	Sending of a complete message in library	46
20h	Request for printer's parameters	64
30h	Stop/Start up printer	30
31h	Sending of jet status/maintenance	42
32h	Request for the status jet	77
33h	Request for the jet and phase speed	78
35h	Request for the state of the ink circuit electrovalves, viscosity level and number of additives	67
36h	Sending of the printer initialisation	37
37h	Request for printer's CRC Proms	69
38h	Sending the parameters of a counter	53
39h	Request for current counters	82
3Ah	Resetting the counters	55
3Bh	Request for printer's faults	71
3Ch	Sending of reset faults	31
3Dh	Sending the shift code parameters	57
3Eh	Sending of keyboard code	31
3Fh	Sending of the security code	32
40h	Sending of the message number to be printed	51
41h	Sending the request for printing acknowledgement	33
42h	Sending a partial message	49
43h	Request for the complete current message	79
44h	Request for recorded operating parameters	65
45h	Request of keyboard code	63
4Ah	Sending the contents of variable fields	52
4Ch	Request for shift code parameters	86
4Dh	Status request for Contrast	75
4Fh	Sending a Multitop per head and postdate 2 per jet	59
50h	Downloading files to the Master, IP65, Contrast	39
51h	Sending current value of counter	54
52h	Request for table of months and shift codes	85
53h	Sending table of months and shift codes	56
56h	Request for PPP printing counter	83
94h	Command of printing	81
C8h	Initialization of autoclock	58
D6h	Request for autoclock	84

2 List of sendings to the printer

Title of the command	Ident.
PRINTER Stop/Start up printer Sending of reset faults Sending of keyboard code Sending of the security code Enable/disable the keyboard with DSR active Sending the request for printing acknowledgement Sending of the printer initialization Downloading files to the Master, IP65, Contrast	30h 3Ch 3Eh 3Fh 0Fh 41h 36h 50h
HEAD Sending of jet status/maintenance	31h
MESSAGE Sending a complete message (printer without library) Sending of message parameters (printer without library) Sending of a message content (printer without library) Sending of a complete message in library Sending of a message parameters in library Sending of a message content in library Sending a partial message Sending of the message number to be printed Sending the contents of variable fields	0Ch 0Bh 0Ah 1Ch 1Bh 1Ah 42h 40h 4Ah
VARIABLES Sending the parameters of a counter Sending current value of a counter Resetting the counters Sending table of months and shift codes Sending the shift code parameters Initialization of autoclock Sending a Multitop per head and postdate 2 per jet	38h 51h 3Ah 53h 3Dh C8h 4Fh

3 List of requests to the printer

Title of the command	Ident.
PRINTER Request for V24 dialog Request of keyboard code Request for printer's parameters Request for recorded operating parameters Request for the state of the ink circuit electrovalves, viscosity level, and number of additives Request for printer's CRC Proms Request for printer's faults Status request for Contrast	 05h 45h 20h 44h 35h 37h 3Bh 4Dh
HEAD Request for the status jet Request for the jet and phase speed	 32h 33h
MESSAGE Request for the complete current message Command of printing	 43h 94h
VARIABLES Request for current counters Request for PPP printing counter Request for autoclock Request for table of months and shift codes Request for shift code parameters	 39h 56h D6h 52h 4Ch

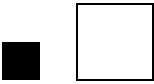
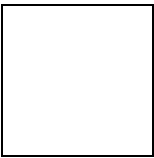


Lists of the V24 commands

Page deliberately left blank.

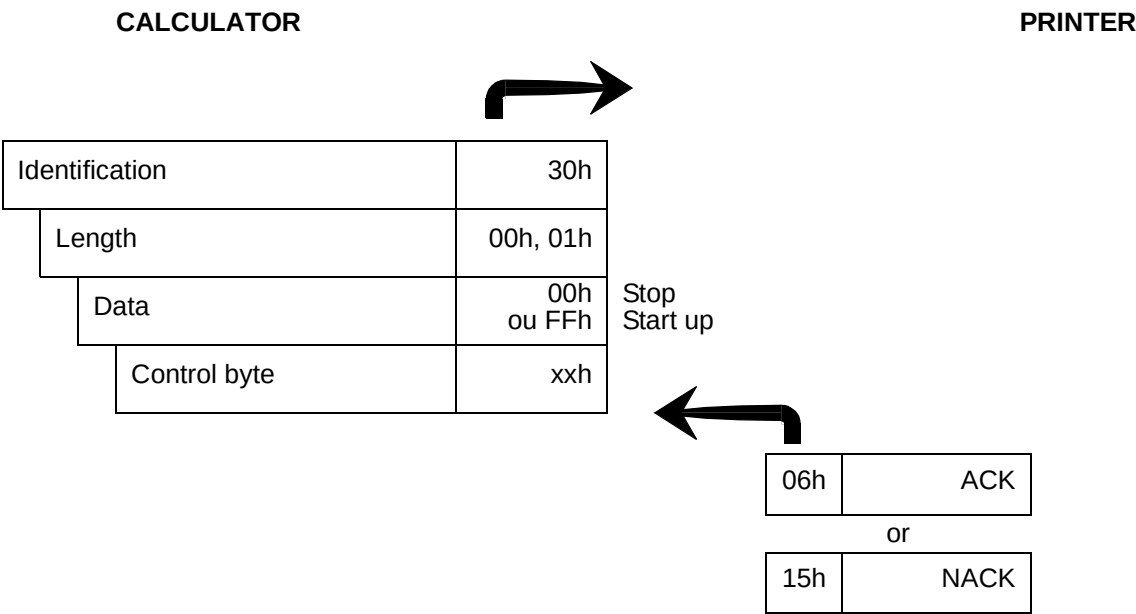
Contents

1	Sendings concerning the printer	30
1.1	Stop/Start up printer	30
1.2	Sending of reset faults	31
1.3	Sending of keyboard code	31
1.4	Sending of the security code	32
1.5	Enable/disable the keyboard with DSR active	33
1.6	Sending the request for printing acknowledgement	33
1.7	Sending of the printer initialisation	37
1.8	Downloading files to the S8 Master, S8 IP65 and S8 Contrast printers	39
2	Sending concerning the print heads	42
3	Sendings concerning messages	43
3.1	Sending a complete message (printer without library)	43
3.2	Sending of message parameters (printer without library)	44
3.3	Sending of a message content (printer without library)	45
3.4	Sending of a complete message in library (parameters and content)	46
3.5	Sending of a message parameters (without content)	47
3.6	Sending of a message content in library (without parameters)	48
3.7	Sending a partial message	49
3.8	Sending of the message number to be printed	51
3.9	Sending the contents of variable fields	52
4	Sendings concerning the variable elements (counter, hour code, autoclock)	53
4.1	Sending the parameters of a counter	53
4.2	Sending the current value of a counter	54
4.3	Resetting the counters	55
4.4	Sending tables of months and shift codes	56
4.5	Sending the shift code parameters	57
4.6	Initialisation of autoclock	58
4.7	Sending a Multitop per head and postdate 2 par jet	59



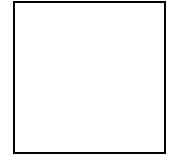
1 Sendings concerning the printer

1.1 Stop/Start up printer

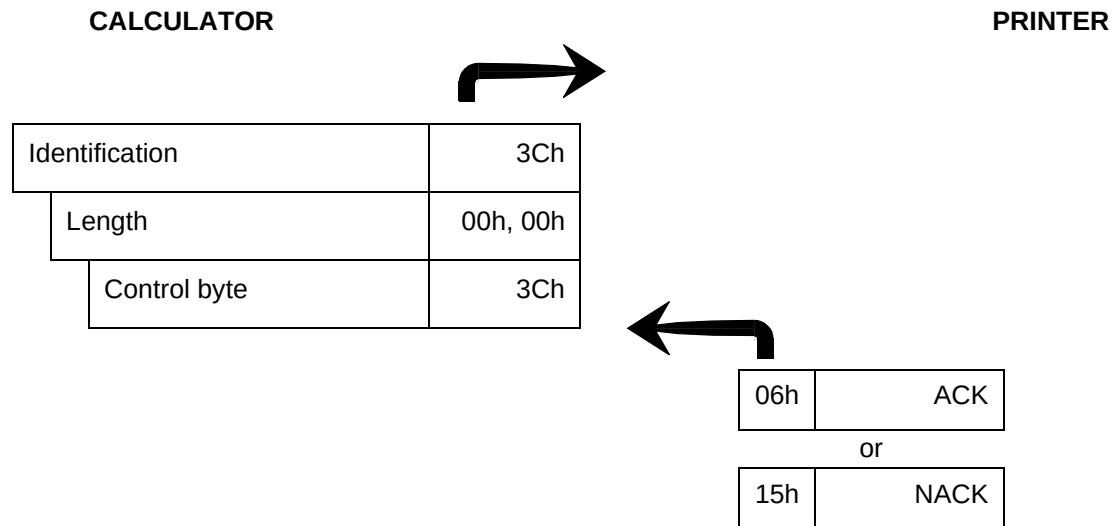


WARNING

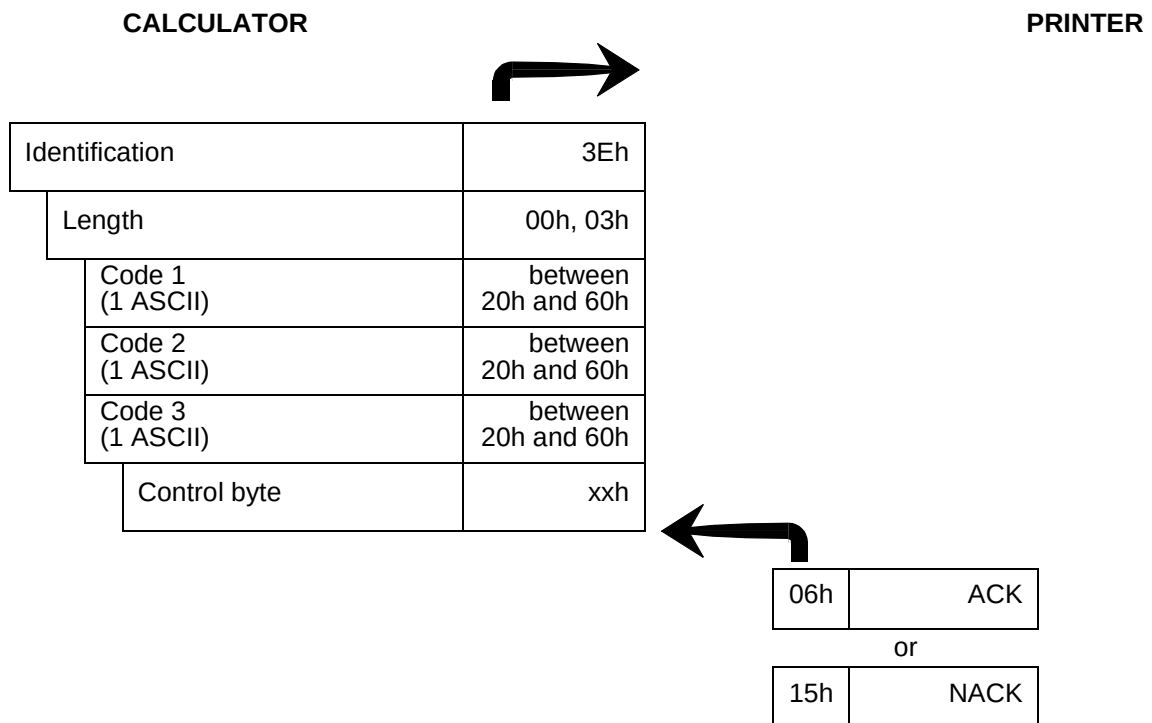
This command can only be used if the +15 V power supply voltages are present when the printer is in standby mode (depends on the power supply model) and if DSR is active.
The printer will start up when the DSR signal appears.



1.2 Sending of reset faults

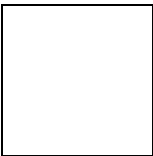


1.3 Sending of keyboard code



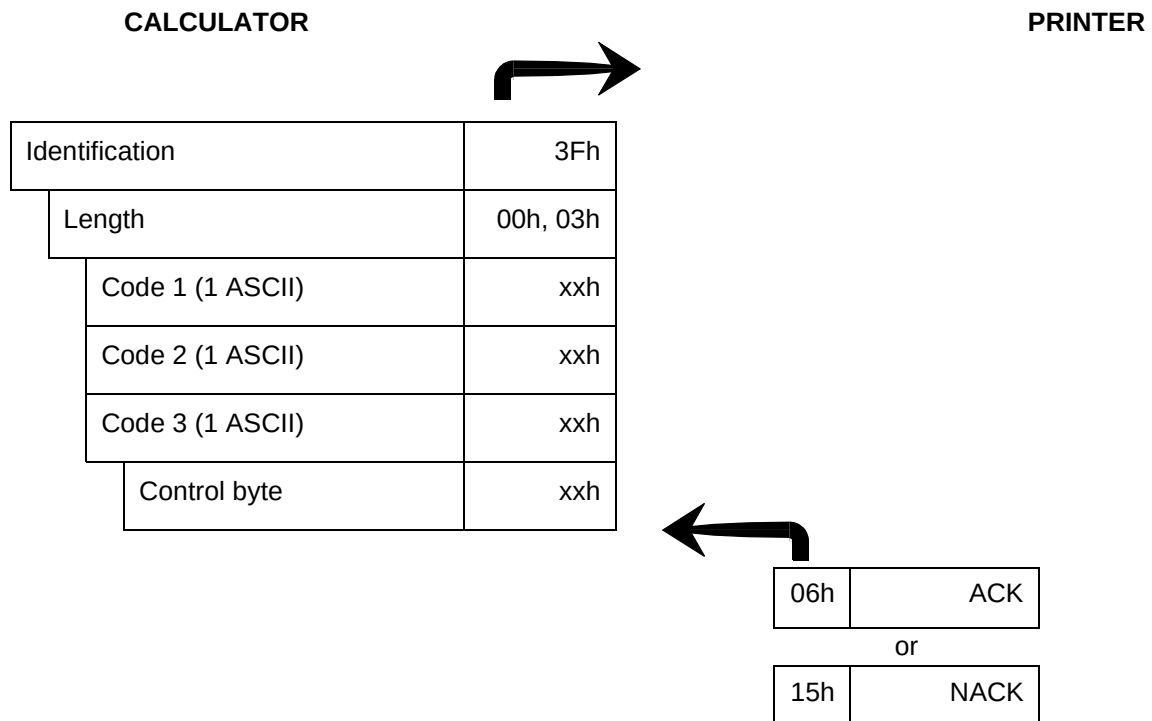
The locking code is a sequence of 3 ASCII characters (alphanumeric) comprised between 20 th and 60 h inclusive.

To delete the locking code, send the coded sequence:
 30h/30h/30h, for Classic
 20h/20h/20h, for Master, IP65 and Contrast.



1.4 Sending of the security code

This code protects the V24 messages. It can be initialised, therefore modified but not visualised. The calculator should recognise the preceding code in order to send other sequences of instructions.

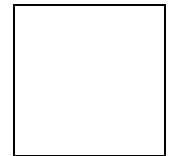


The security code is a sequence of 3 ASCII characters (alphanumeric) comprised between 20h and 60h inclusive.

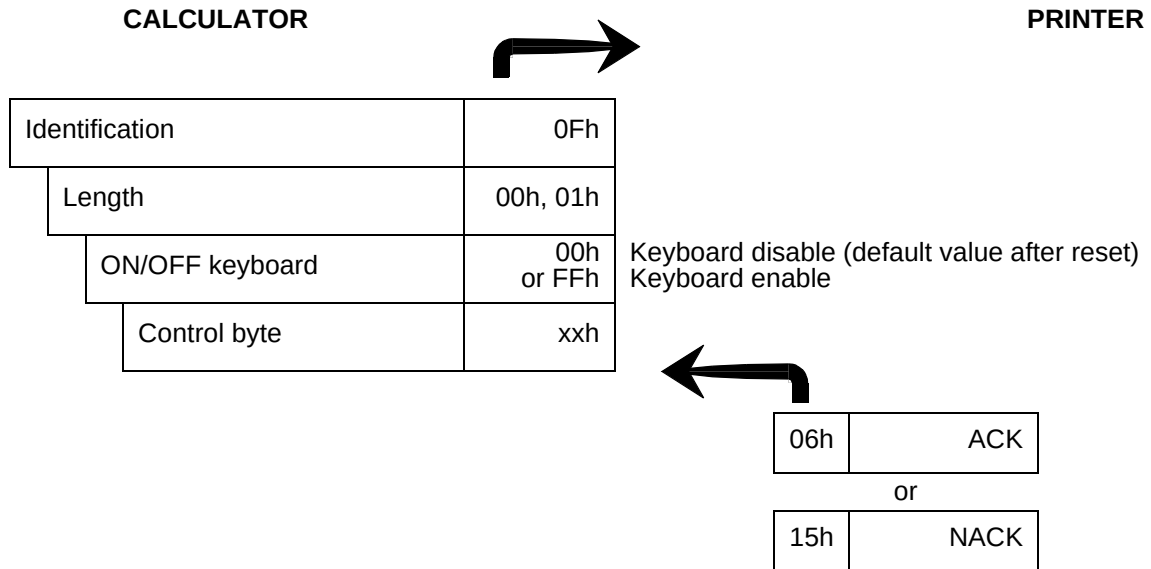
Transmission of NACK, SP corresponds to an incorrect security code.

NOTE	The security code, if it was transmitted to the printer at the end of the previous utilisation, must be sent in the first sequence of each exchange.
-------------	---

REMINDER	After a reset of the memory of the CPU board, the printer automatically sets the security code to "TWO".
-----------------	---



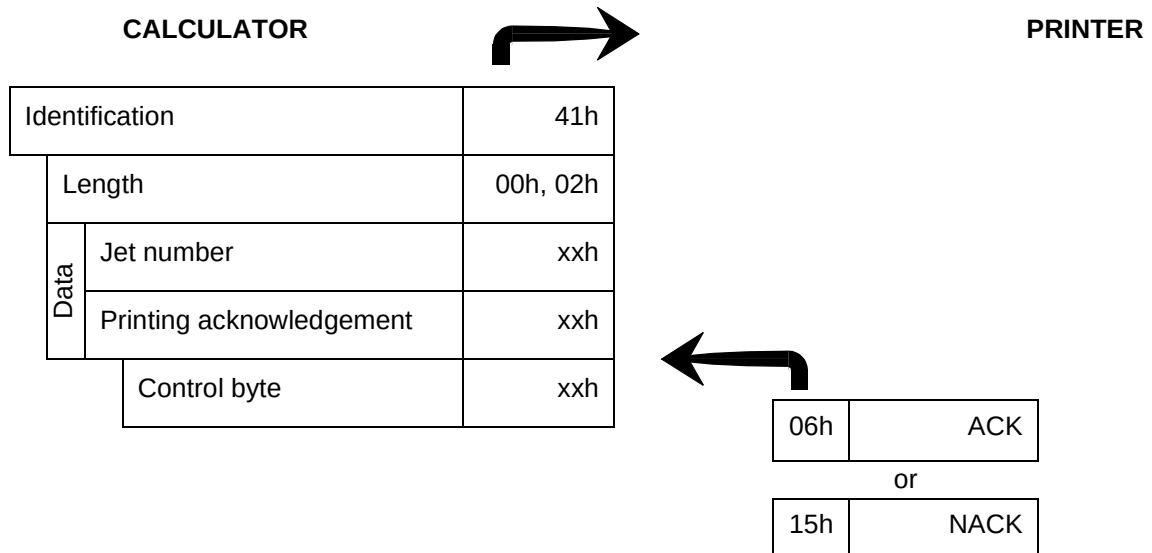
1.5 Enable/disable the keyboard with DSR active



REMINDER

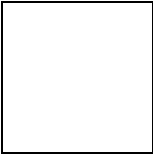
Do not use the keyboard to make any changes to the printer during a V24 dialogue (risk of conflicts).
You are also recommended to leave the Master, IP65 and Contrast printers in the "MAIN MENU" during a V24 dialogue.

1.6 Sending the request for printing acknowledgement



WARNING

The print acknowledgement request should be sent to all the jets of a head.

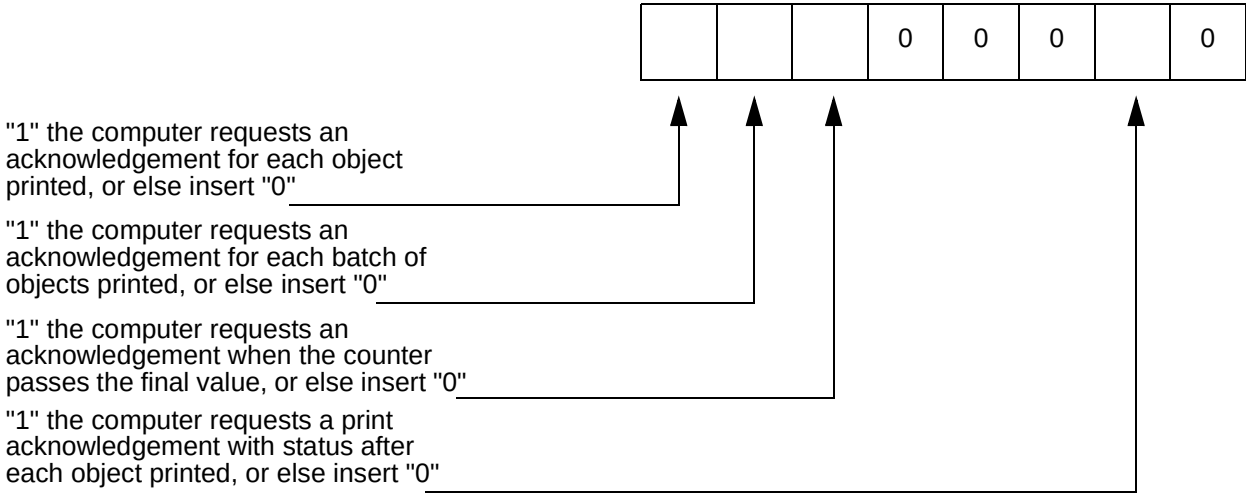


Detail of the data bytes

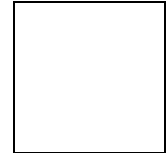
- Detail of the "Jet number" byte .

Printer	Head	Jet	Jet number
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

- Detail of the "Printing acknowledgement" byte.



NOTE Only one of these operating modes can be active at any one time.



1.6.1 Print acknowledgement

CALCULATOR

PRINTER



xxh	Printing acknowledgement
-----	--------------------------

- Detail of the print acknowledgement

Head 1

Head 2

E5h

E6h

After each object

E9h

EAh

After each batch

F1h

F2h

After each final counter value

E1h

E2h

On reception of DTOP if printing is impossible (fault or jet in start-up or shutdown phase)

1.6.2 Print acknowledgement with Status after each object

CALCULATOR

PRINTER



xxh	Printing acknowledgement after each object	Data
xxh	General faults	
xxh xxh	Motor speed	
xxh	Pressure	
xxh	Viscosity	
xxh	Jet 1 speed	
xxh	Jet 2 speed	
xxh	Jet 3 speed	
xxh	Jet 4 speed	

Detailed description of data

- Detail of the print acknowledgement

Head 1

Head 2

E5h

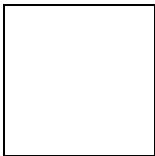
E6h

After each object

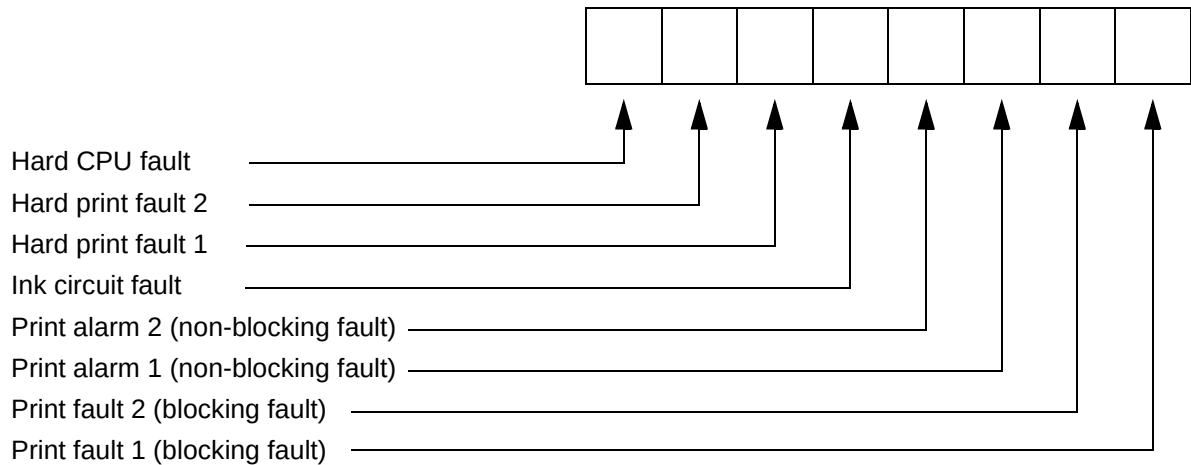
E1h

E2h

On reception of DTOP if printing is impossible (fault or jet in start-up or shutdown phase)



• **Detail of the "General faults" bytes**



1 = fault
0 = no fault

• **Detail of the "Motor speed" byte:**

The printer sends two hexadecimal bytes, representing the motor speed in decimal.

Calculation of the motor speed in rpm:
$$\frac{3000}{\text{Motor speed in decimal}}$$

• **Detail of the "Pressure" byte:**

The printer sends one hexadecimal byte, representing the pressure in decimal.

Calculation of the pressure in millibars : pressure in decimal x 19.6 for heads M and G
: pressure in decimal x 39.2 for head P.

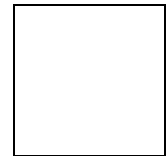
• **Detail of the "Viscosity" byte:**

The printer sends one hexadecimal byte, representing the viscometer filling time in seconds.

• **Detail of the "Jet speed" bytes:**

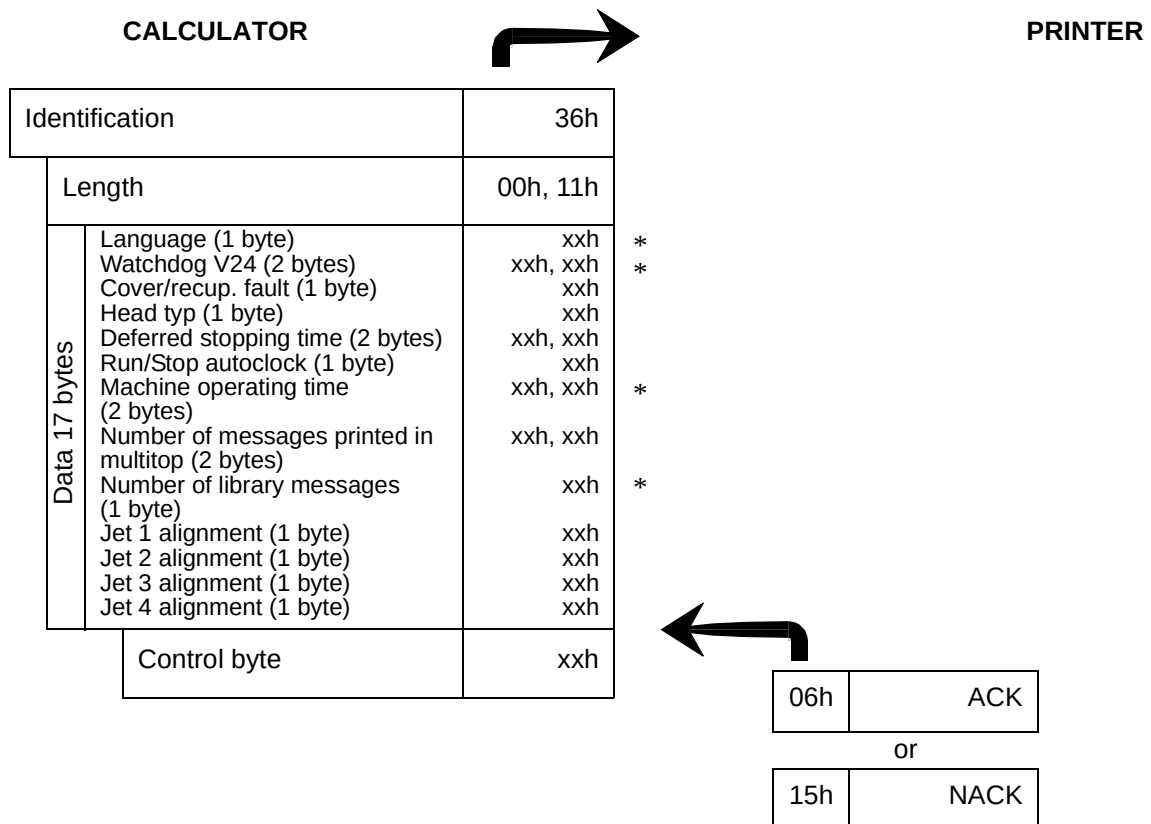
The printer sends one hexadecimal digit, representing the jet speed in decimal.

Calculation of the jet speed in m/second:
$$\frac{\text{Jet speed in decimal}}{10}$$



1.7 Sending of the printer initialisation

WARNING Bytes marked with an asterisk * are only taken into account on Classic printers.



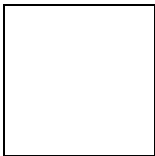
Detail of the data bytes

- Language: *

00h FRENCH	06h NORWEGIAN
01h ENGLISH	07h SWEDISH
02h GERMAN	08h DANISH
03h ITALIAN	09h PORTUGUESE
04h SPANISH	0Ah JAPANESE
05h DUTCH	

- Watchdog V24: *

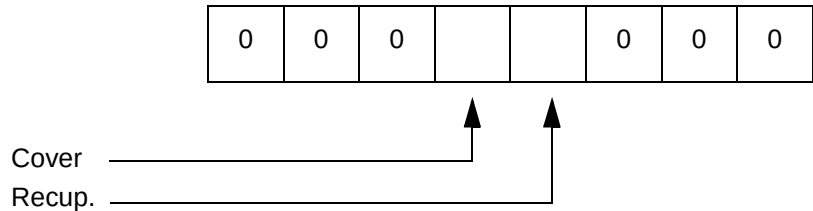
Time in tens of milliseconds, from 1 to 9999, in hexadecimal coding on 2 bytes.



Sendings to the printer

- Cover/recup. fault byte:

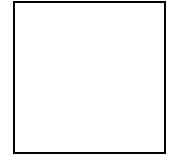
State 0 = Fault active
State 1 = Fault inactive



- Head type:

00h : 1 head single jet	03h : 2 heads twinjet
01h : 2 heads single jet	04h : 1 head four jets
02h : 1 head twinjet	

- Deferred stopping time:
Time in minutes in hexadecimal coding on 2 bytes.
- Run/Stop autoclock:
00h = Run
FFh = Stop
- Machine operating time: *
Printer operating time expressed in hours and hexadecimal coded on 2 bytes.
- Number of print operations in multitop mode:
Number of messages printed following an object TOP hexadecimally coded in two bytes.
If this value is equal to 0001h (default value), it is possible to parameterise a multitop operation for each printing head using the command 4Fh.
If a different value is entered, the multitop operation applies to all the jets of all the heads.
In this case, the Multitop command in 4Fh is inoperative.
- Number of library messages: *
Number of possible library messages, encoded in hexadecimal in one byte.
- Jet "n" alignment:
Number of delay frames which can be allocated to a jet relative to another in order to line up their respective printing.
This number is encoded in hexadecimal in one byte.



1.8 Downloading files to the Master, IP65 and Contrast printers

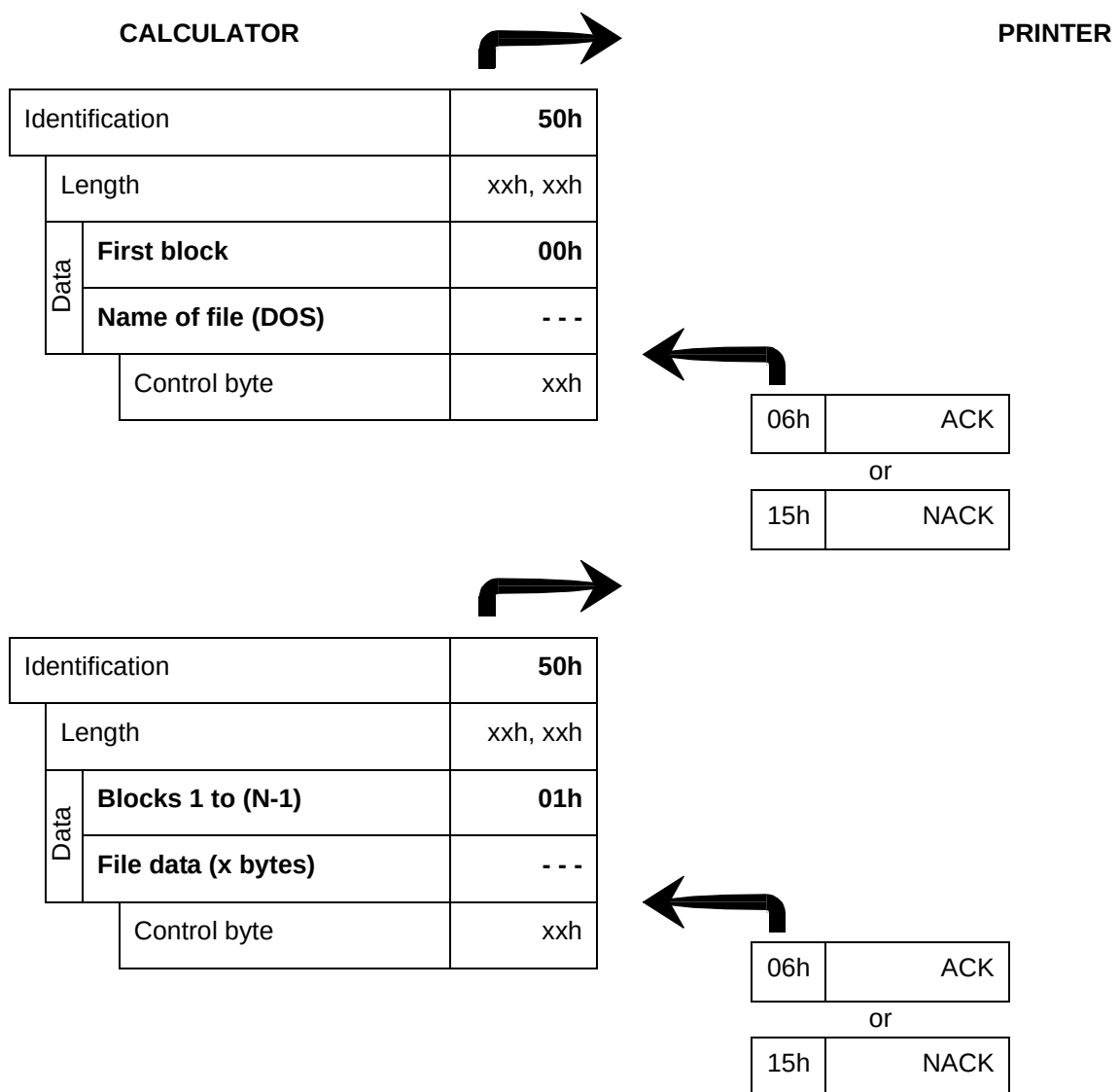
1.8.1 Sending files in blocks

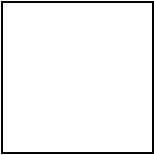
For editing: load the files MASTER, IMAJE.INI, S4P.BDG, *.GCG

For languages: load the files *.RC, *.IDX and* GCG for certain languages.

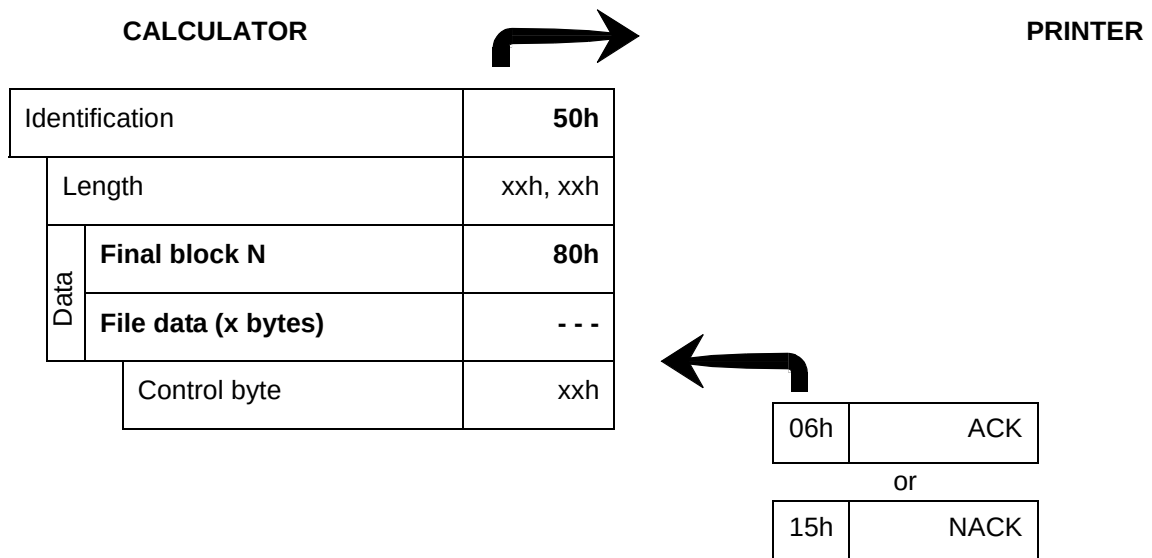
The downloaded files are copied to the root of drive C.

The transfer format is as follows:





Sendings to the printer

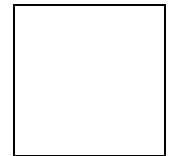


Detail of the data bytes:

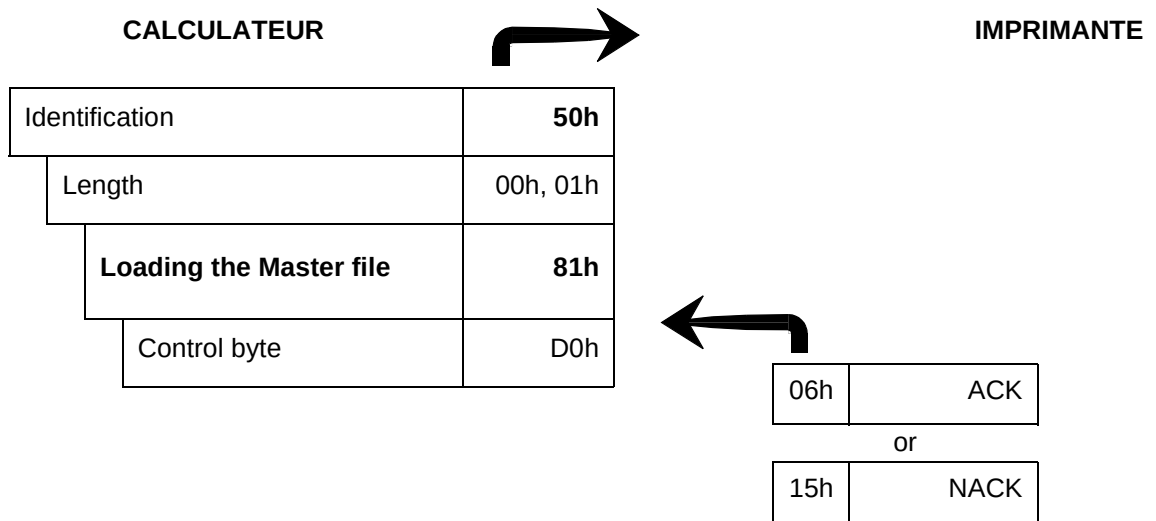
- "Name of file" bytes:
Maximum of 8 characters (DOS format).
- "Length" bytes:
The calculator sends 2 bytes in hex. format representing the length of the data (block number + file data).
Maximum length of file data = 1 KB (1024 bytes).
- "Block number" bytes:
Transmissions must always be performed in the following order:
00h = transmission of the DOS file name in the file data (first block),
01h = transmission of blocks 1 to (N-1) of file data,
80h = transmission of final block (N) of file data.

WARNING

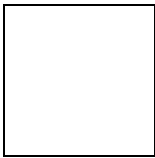
If the file already exists in the printer it will be overwritten when the first block containing the same file name is received. Downloaded files are not recognised until the printer is restarted.



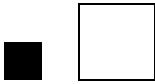
1.8.2 Sending the command to load the Master file



NOTE The printer's response may take up to 30 s.
 Sending this command automatically restarts the printer.

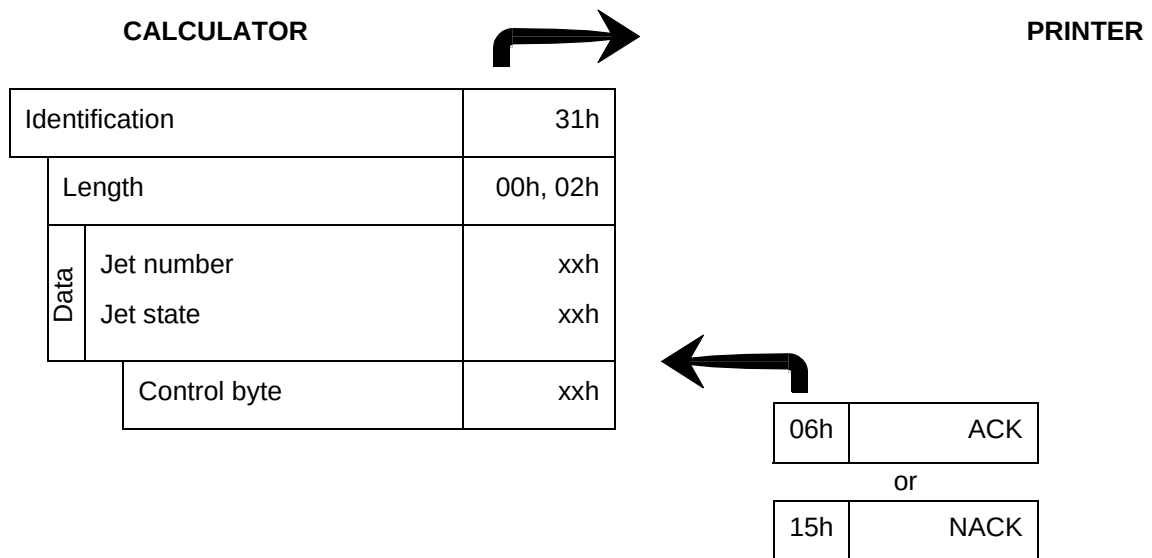


Sendings to the printer



2 Sending concerning the print heads

Sending of jet status/maintenance



Detail of the data bytes :

- Number of the jet:

To command the jet(s) of head 1, send the following hexadecimal value: 01h.

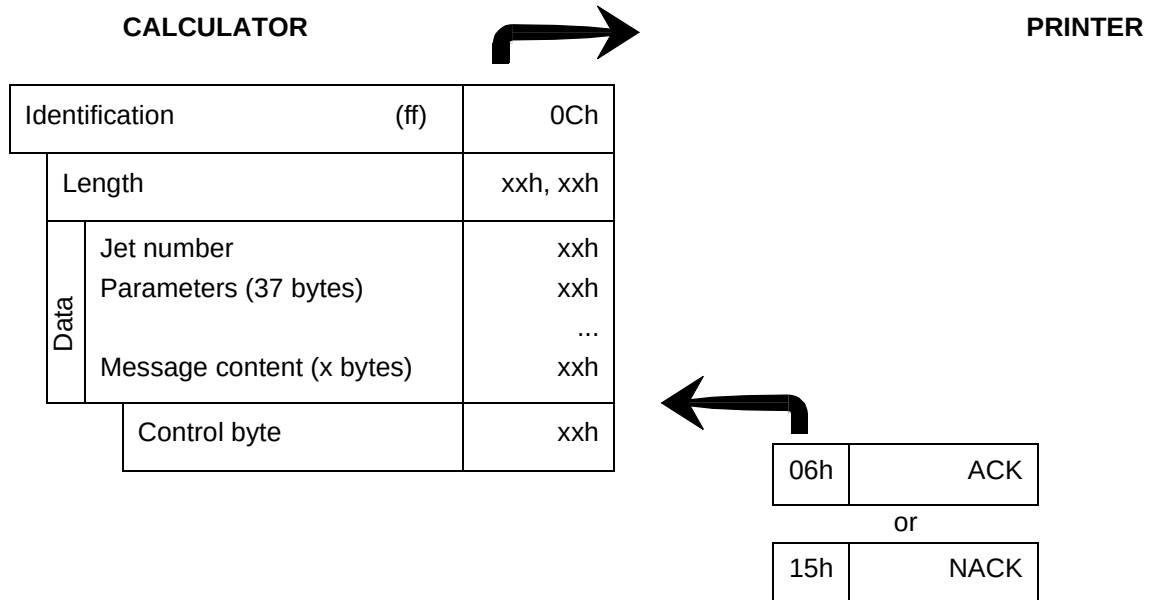
To command the jet(s) of head 2, send the following hexadecimal value: 03h.

- State of the jet:

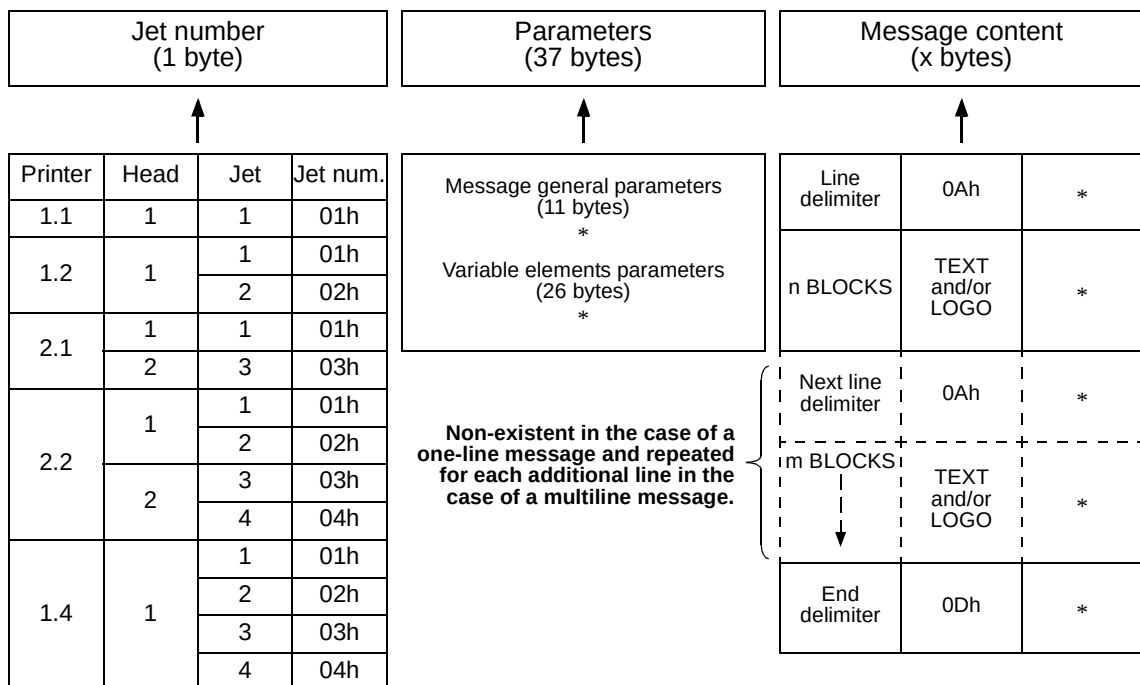
0	to stop the jet	00h
1	to start the jet	01h
2	to refresh the jet	02h
3	to stabilize the jet	03h
4	to introduce a solvent	04h
5	to unblock a nozzle	05h
6	to adjust the jet the gutter	06h

3 Sendings concerning messages

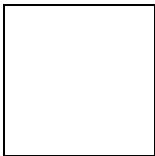
3.1 Sending a complete message (printer without library)



Detail of the data bytes

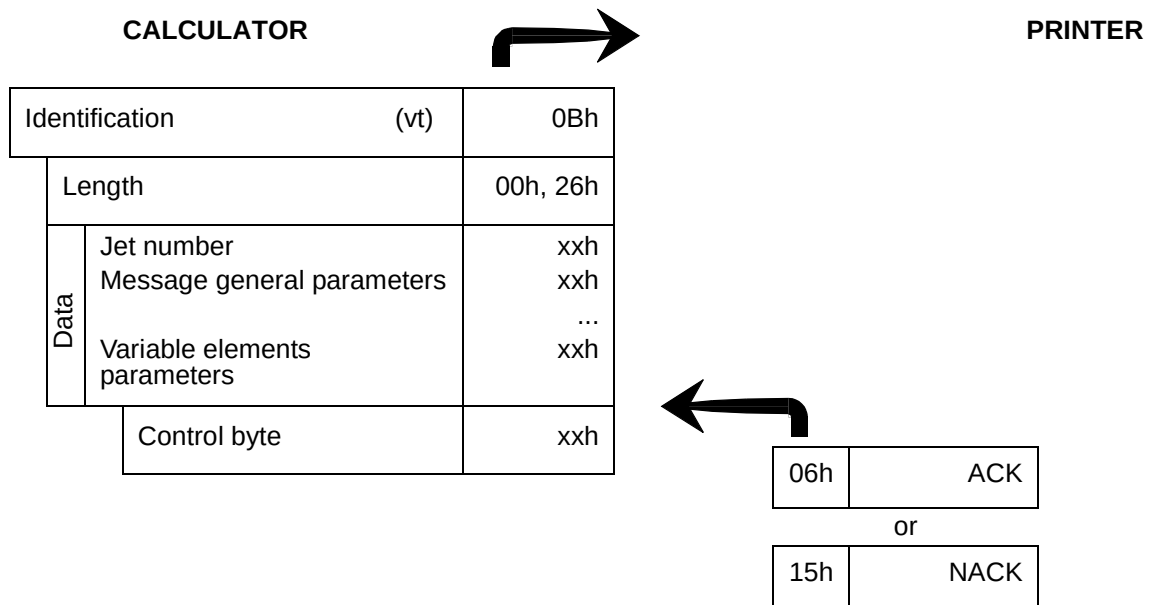


*: See section "Precise details about the data bytes".



Sendings to the printer

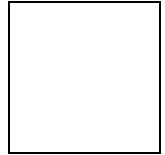
3.2 Sending of message parameters (printer without library)



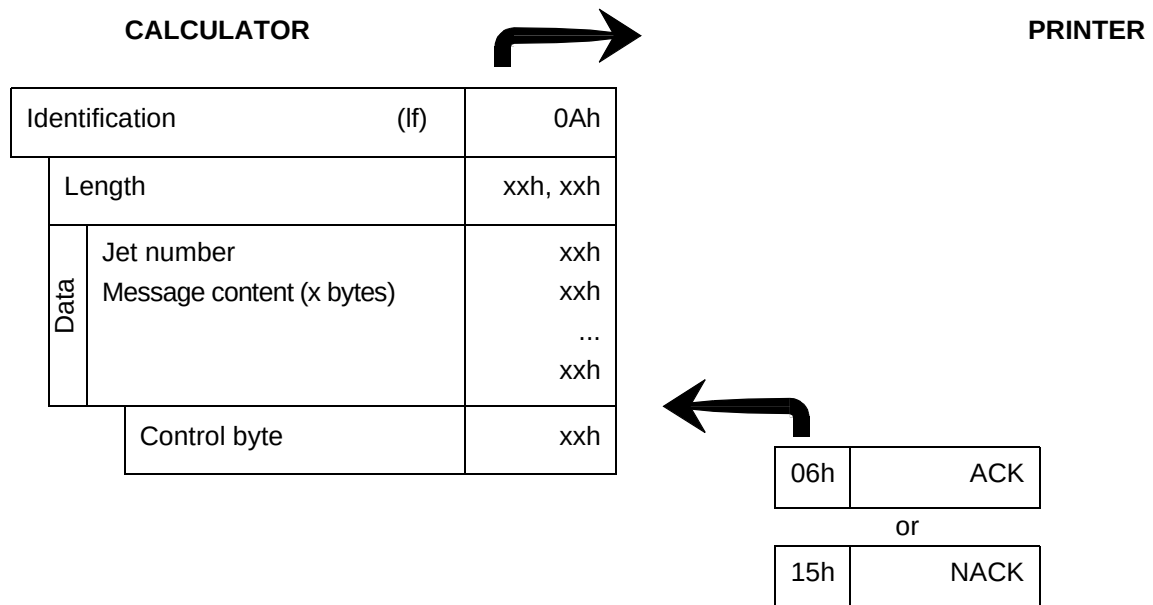
Detail of the data bytes

Jet number (1 byte)				Message general parameters (11 bytes)				Variable elements parameters (26 bytes)			
Printer	Head	Jet	Jet num.	Message sense Horizontal sense Vertical sense Tacho mode Set off Print speed Forward Return margins Interval Top filter				Counter: - zeros before figure - incrementation type - initial value - final value - etc. Autoclock: - postdate interval			
1.1	1	1	01h								
1.2	1	1	01h								
		2	02h								
2.1	1	1	01h								
	2	3	03h								
2.2	1	1	01h								
		2	02h								
	2	3	03h								
		4	04h								
1.4	1	1	01h								
		2	02h								
		3	03h								
		4	04h								

*: See section "Precise details about the data bytes".



3.3 Sending of a message content (printer without library)

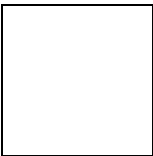


Detail of the data bytes

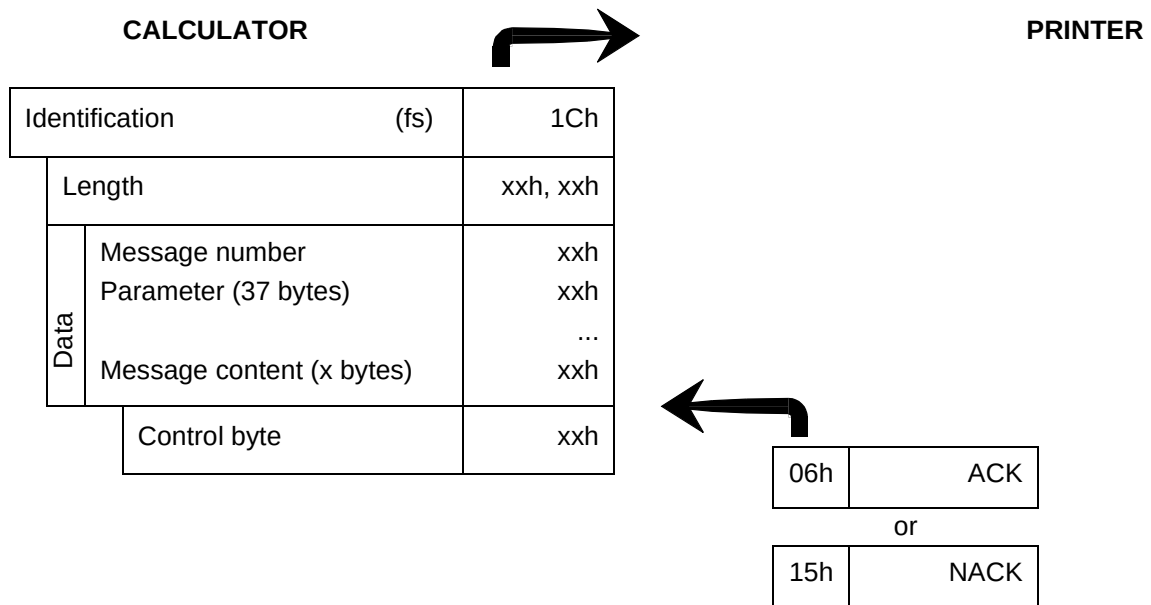
Jet number (1 byte)				Message content (M bytes)		
Printer	Head	Jet	Jet num.	Line delimiter	0Ah	*
1.1	1	1	01h	n BLOCKS ↓	TEXT and/or LOGO	*
1.2	1	1	01h			
		2	02h			
2.1	1	1	01h	Next line delimiter ↓	0Ah	*
	2	3	03h			
2.2	1	1	01h	m BLOCKS ↓	TEXT and/or LOGO	*
		2	02h			
	2	3	03h			
		4	04h			
1.4	1	1	01h	End delimiter	0Dh	*
		2	02h			
		3	03h			
		4	04h			

Non-existent in the case of a one-line message and repeated for each additional line in the case of a multiline message.

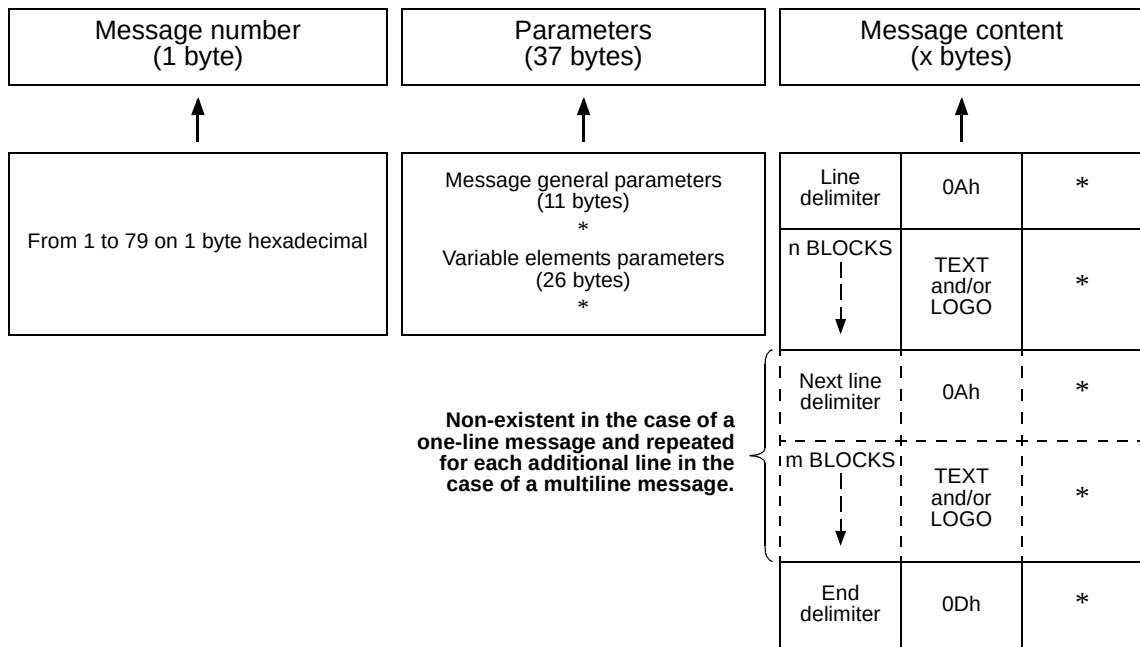
*: See section "Precise details about the data bytes".



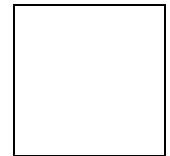
3.4 Sending of a complete message in library (parameters and content)



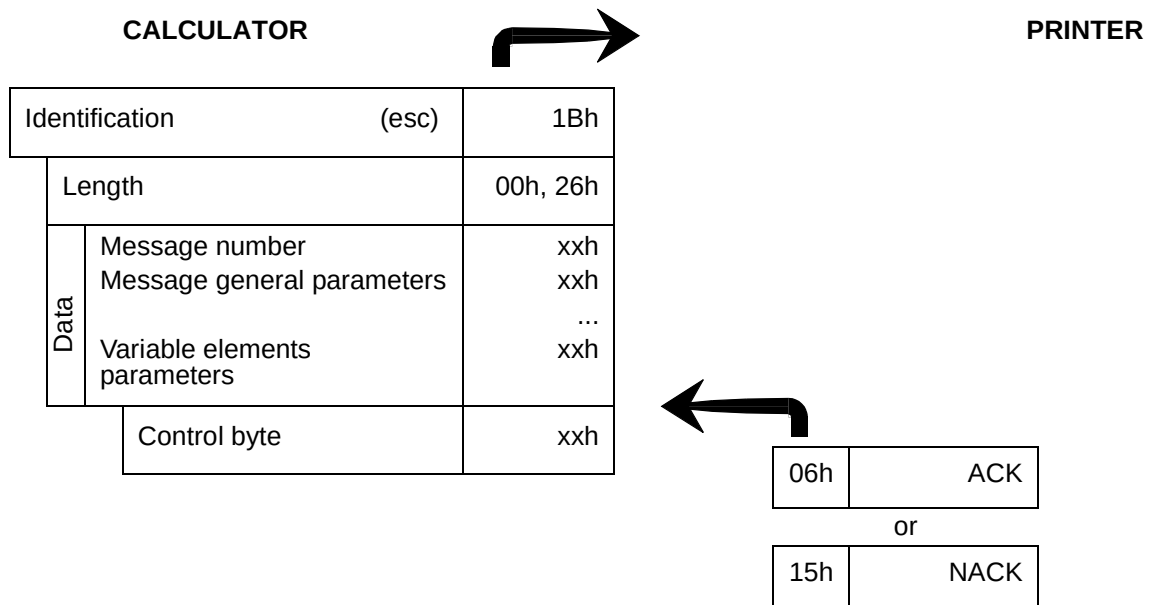
Detail of the data bytes



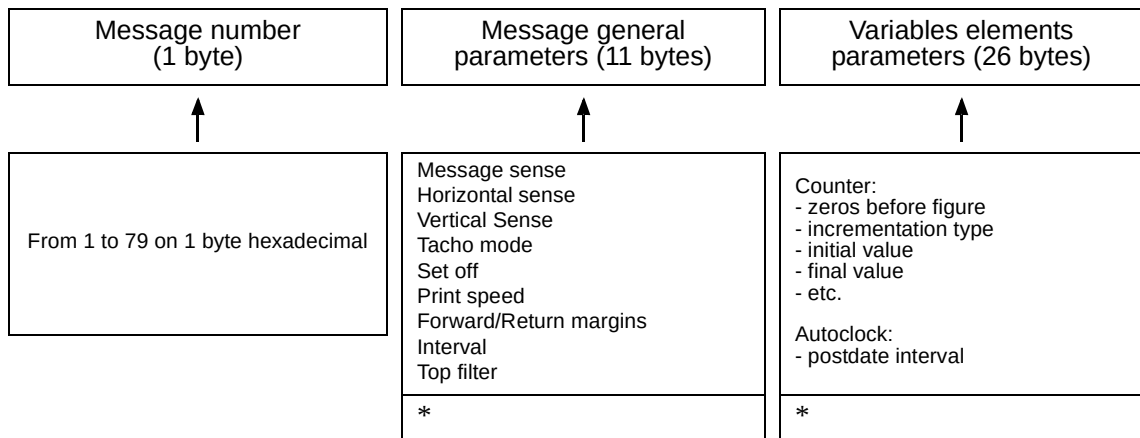
*: See section "Precise details about the data bytes"



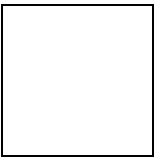
3.5 Sending of a message parameters (without content)



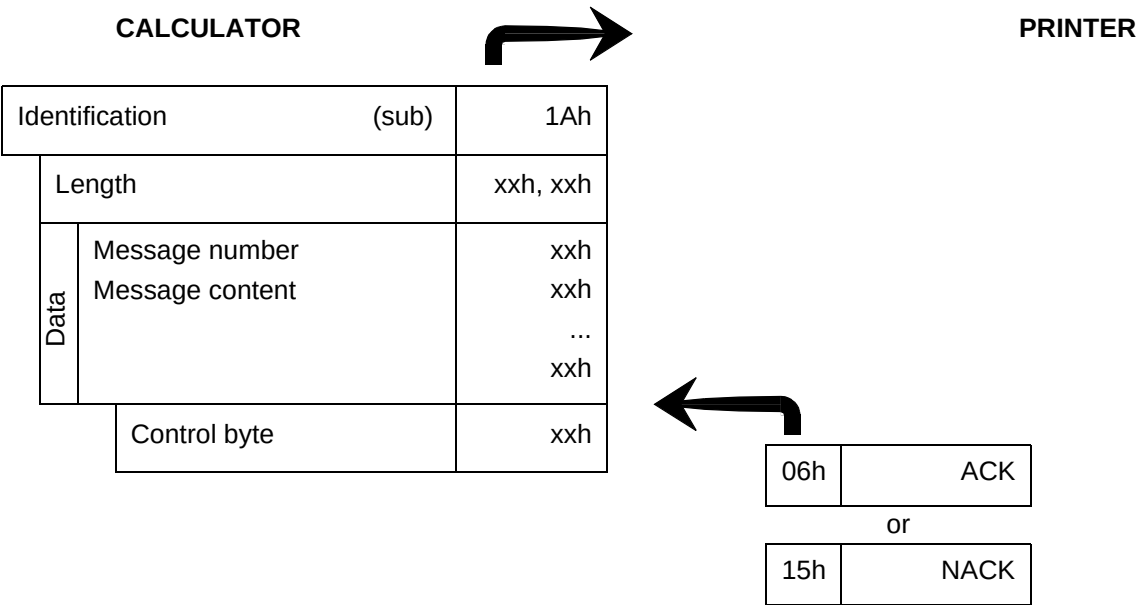
Detail of the data bytes



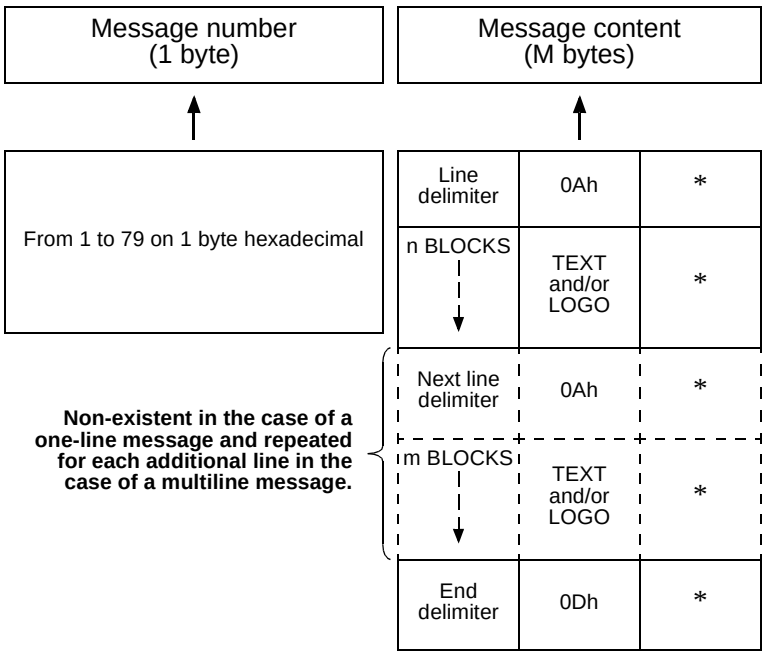
*: See section "Precise details about the data bytes".



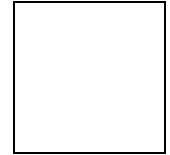
3.6 Sending of a message content in library (without parameters)



Detail of the data bytes

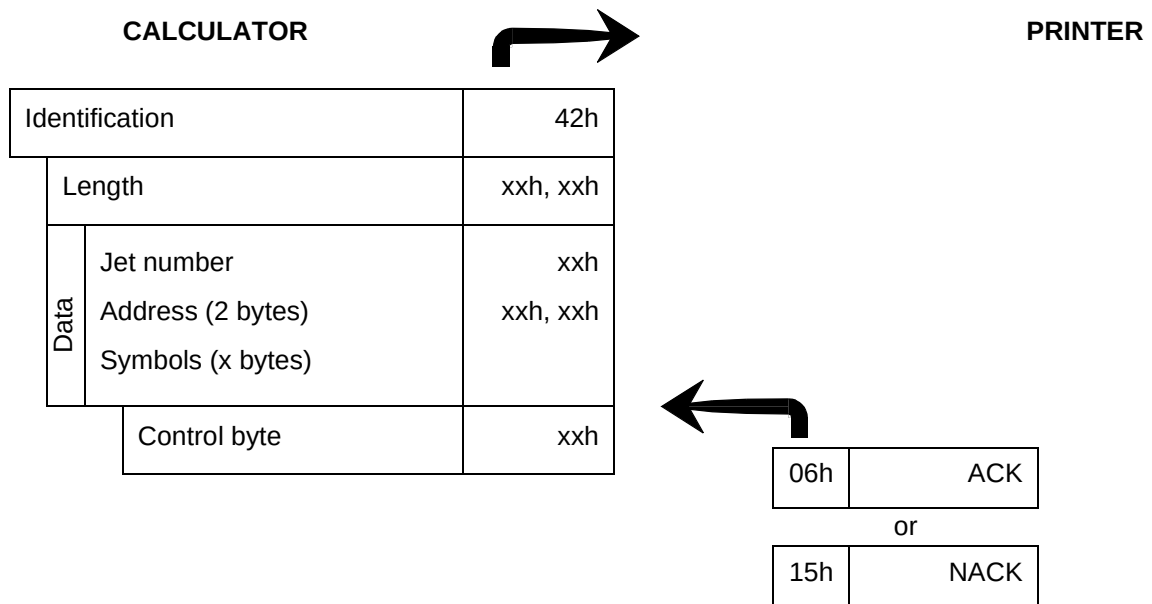


*: See section "Precise details about the data bytes".



3.7 Sending a partial message

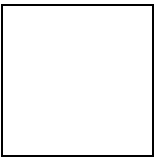
This command makes it possible to modify current messages, that is to say those selected for printing.



Detail of the data bytes

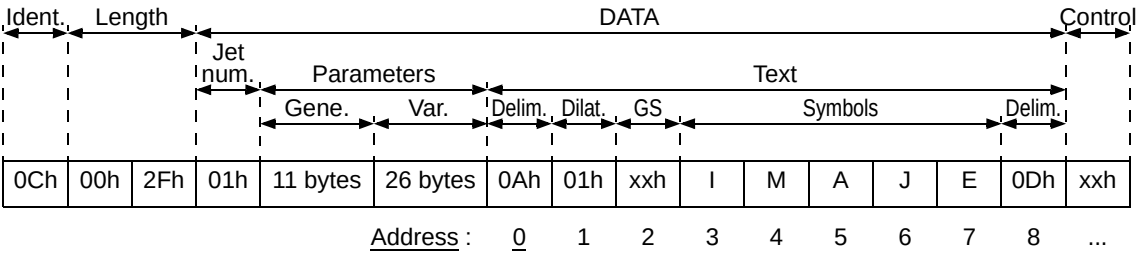
Jet number (1 byte)				Address (2 bytes)		Symbols (x bytes)	
Printer	Head	Jet	Jet num.	Address concerning the first symbol to be modified. The address 0 corresponds to the delimiter (0Ah) of the beginning of line.		Succession of replacement symbols.	
1.1	1	1	01h				
1.2	1	1	01h				
		2	02h				
2.1	1	1	01h				
	2	3	03h				
2.2	1	1	01h				
		2	02h				
	2	3	03h				
		4	04h				
1.4	1	1	01h				
		2	02h				
		3	03h				
		4	04h				

See following example.



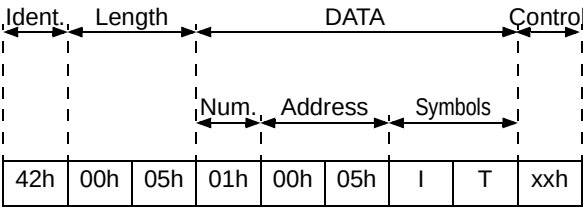
Sendings to the printer

- Sent of a complete message on the jet 1 (printer without library)

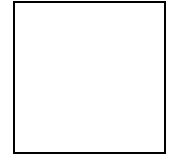


The printing is: IMAJE

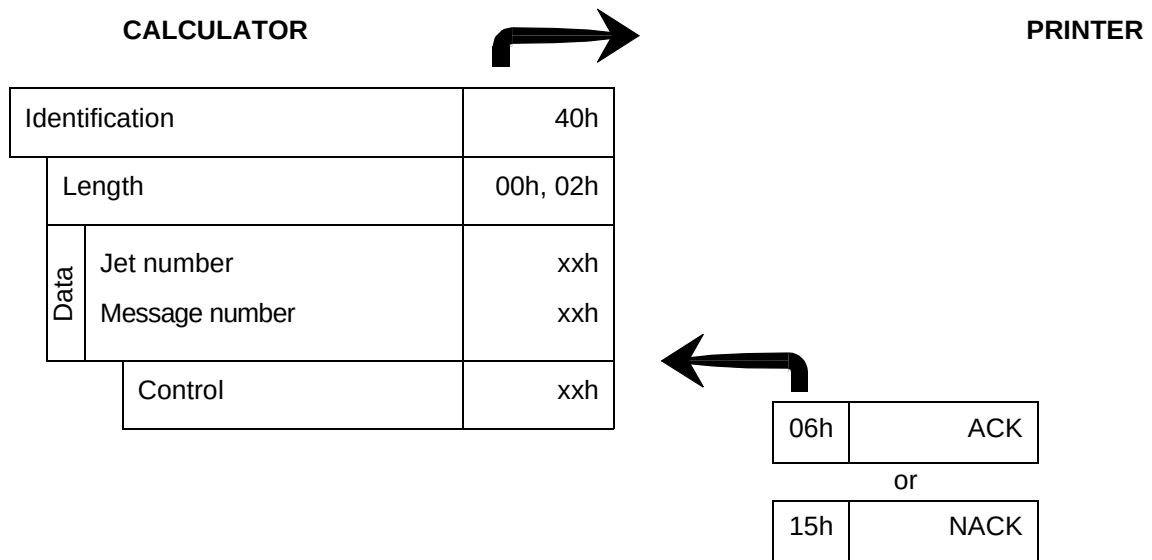
- Modification of the message by **sending a partial message.**



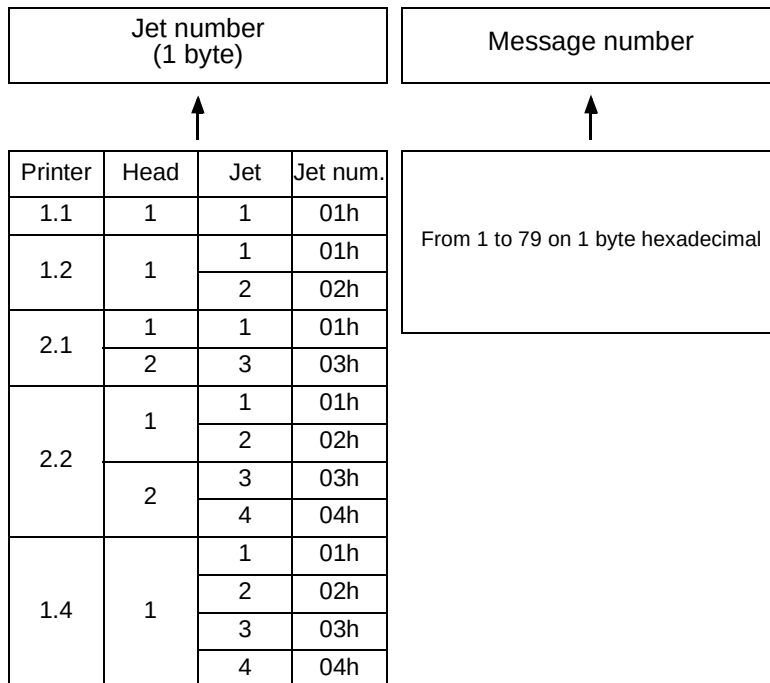
The printing is: IMITE

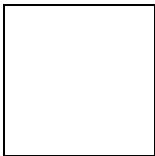


3.8 Sending of the message number to be printed

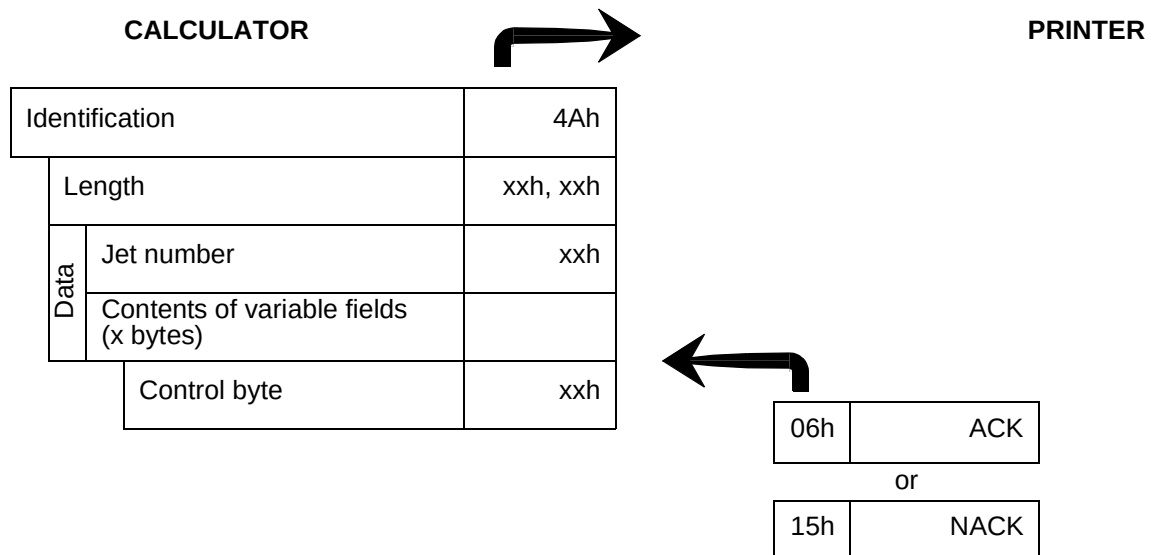


Detail of the data bytes





3.9 Sending the contents of variable fields



- **Detail of the "contents of variable fields"**

This field contains a string of characters in the exact order of the variable fields in the base message. The number of characters sent must be exactly equal to the number of spaces reserved in the base message. A bar code can be contained in a variable field.

NOTE In the base message, the variable fields are contained between two 12h delimiters.

Example:

Base message on jet 1:

WEIGHT: 12h xxx 12h Grams -PRICE: 12h xxxxx 12h Frs - 12h xxxx 12h Euros

↑
Text

↑
Variable field
delimiter

↑
Variable field
(3 non-significant
characters)

↑
Delimiter

↑
Text

↑
Delimiter

↑
Variable field
(5 non-significant
characters)

↑
Delimiter

↑
Text

↑
Delimiter

↑
Variable field
(4 non-significant
characters)

↑
Delimiter

↑
Text

Sending of variable fields:

4Ah 00h0Dh 01h 32517,752,69 xxh
Ident. Length N° jet 12 charac. ASCII Control

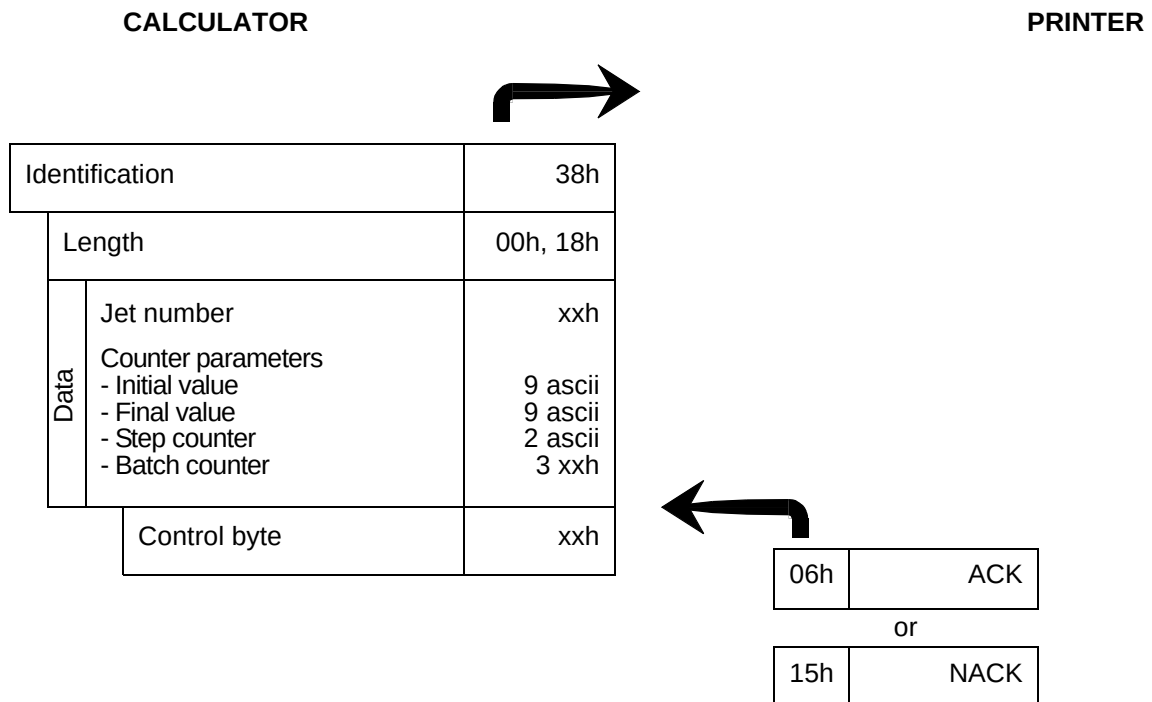
Printing message:

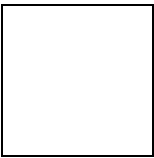
WEIGHT: 325 Grams - PRICE: 17.75 Frs - 2.69 Euros

4 Sendings concerning the variable elements (counter, hour code, autoclock)

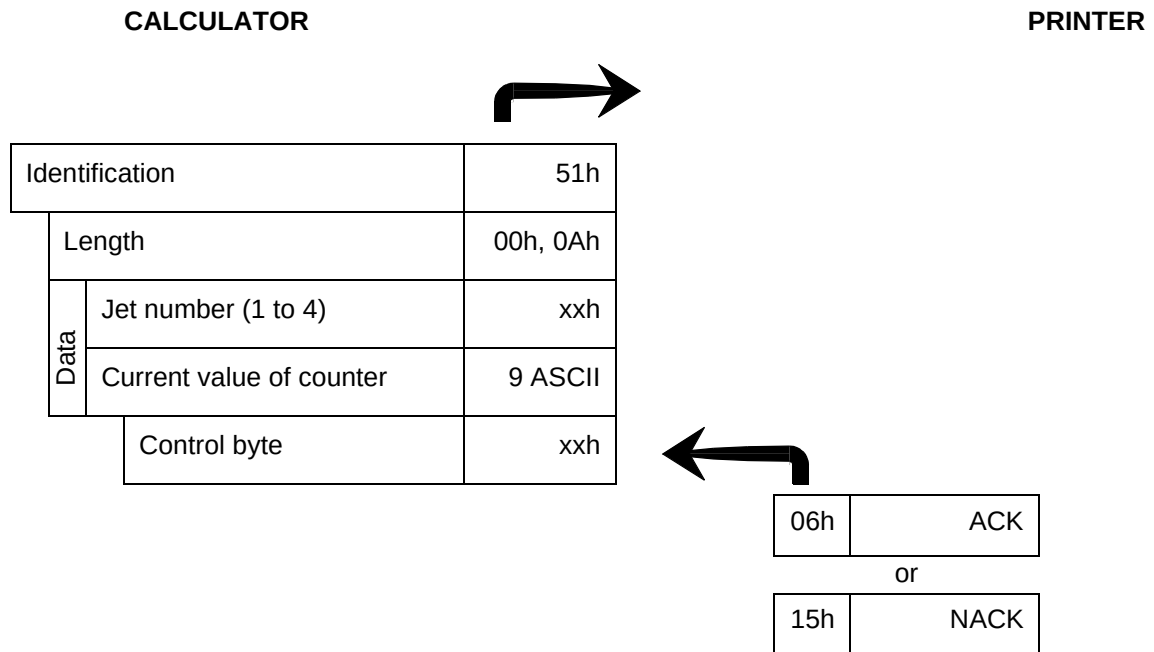
4.1 Sending the parameters of a counter

With this command it is possible to modify the parameters of a current message counter: that is to say, those selected for printing.



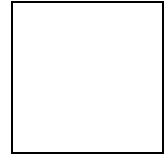


4.2 Sending the current value of a counter

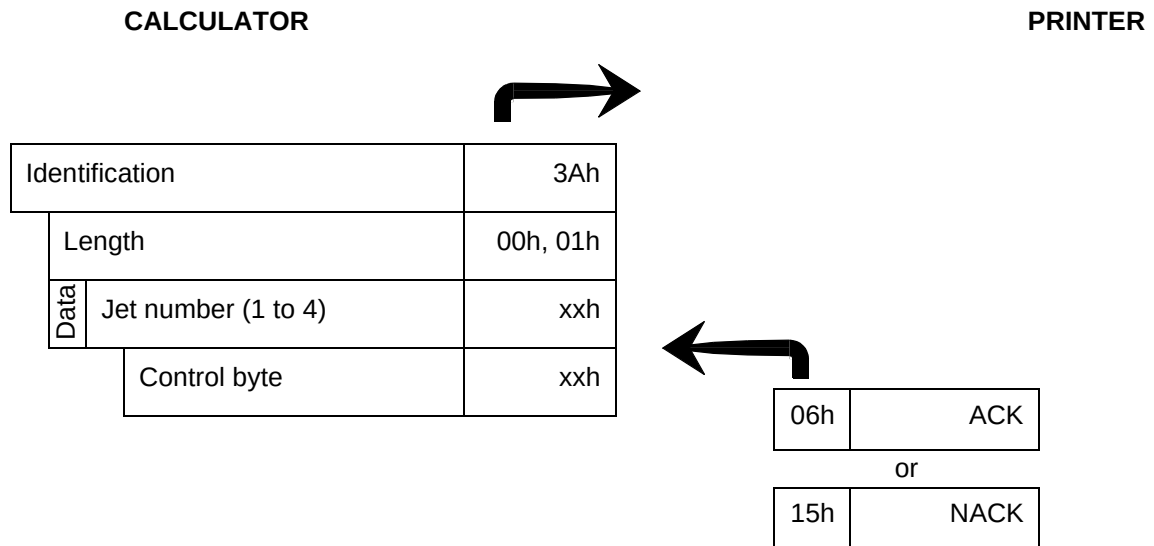


Detail of the data bytes

Jet number (1 byte)			
Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

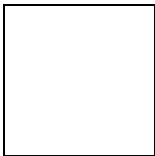


4.3 Resetting the counters

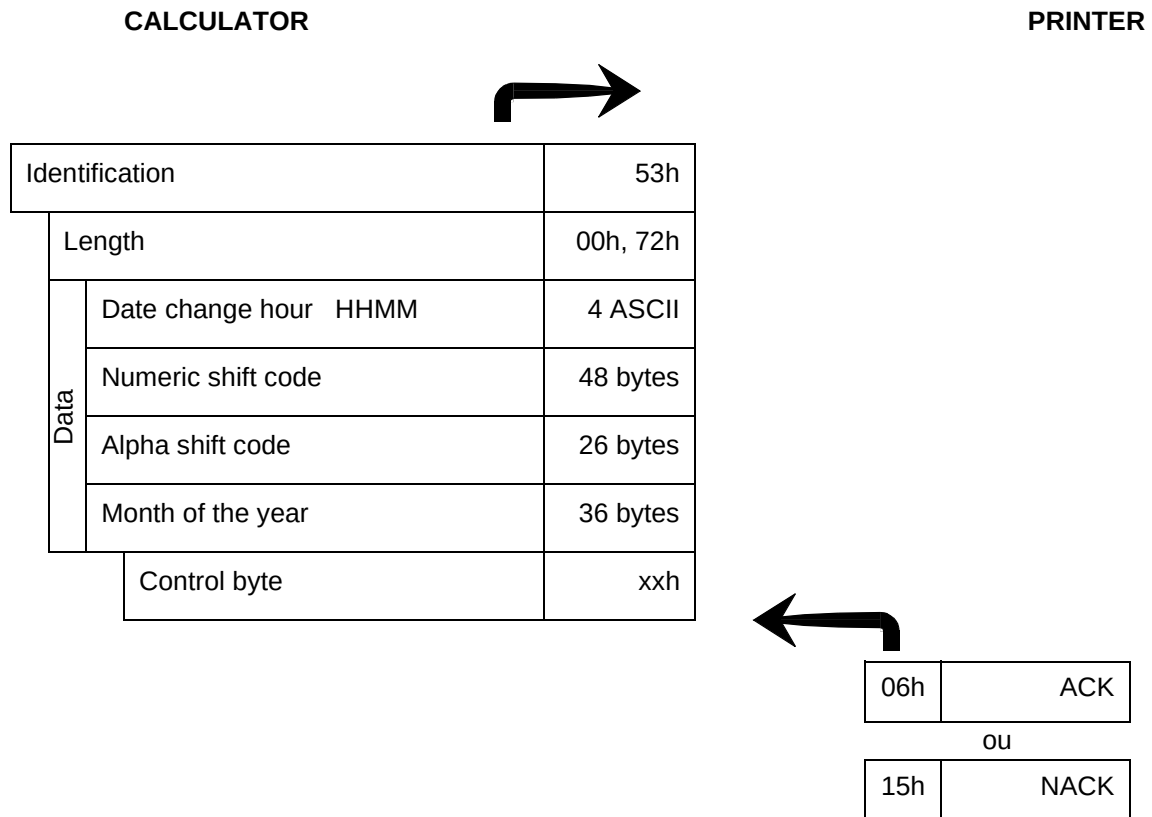


Detail of the data bytes

Jet number (1 byte)			
↑			
Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

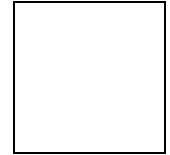


4.4 Sending tables of months and shift codes

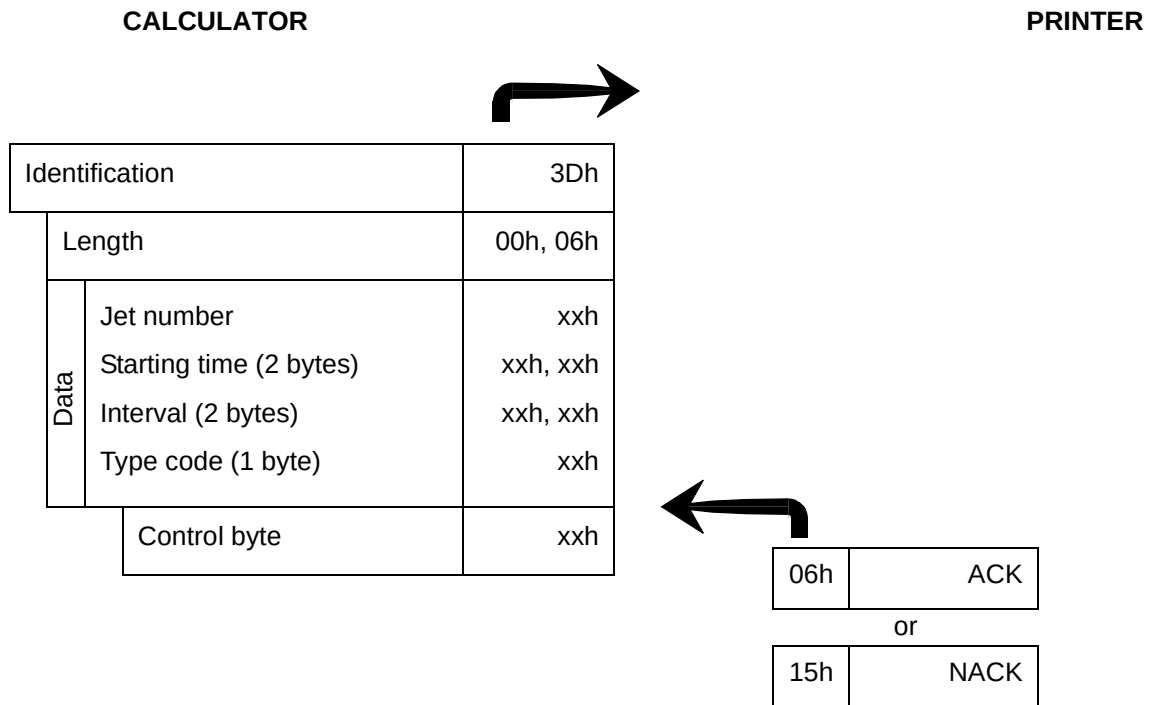


Detail of the data bytes

- "Date change hour" bytes: HHMM in ASCII.
- "Numeric shift code" bytes: 24 codes of any two characters:
01-02-03-04-05-06-07-08-09-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24
- "Alpha shift code" bytes: 26 codes of any single character:
A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-S-T-U-V-W-X-Y-Z
- "Month of the year" bytes: 12 codes of any three characters:
JAN-FEV-MAR-AVR-MAI-JUN-JUI-AOU-SEP-OCT-NOV-DEC

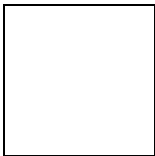


4.5 Sending the shift code parameters

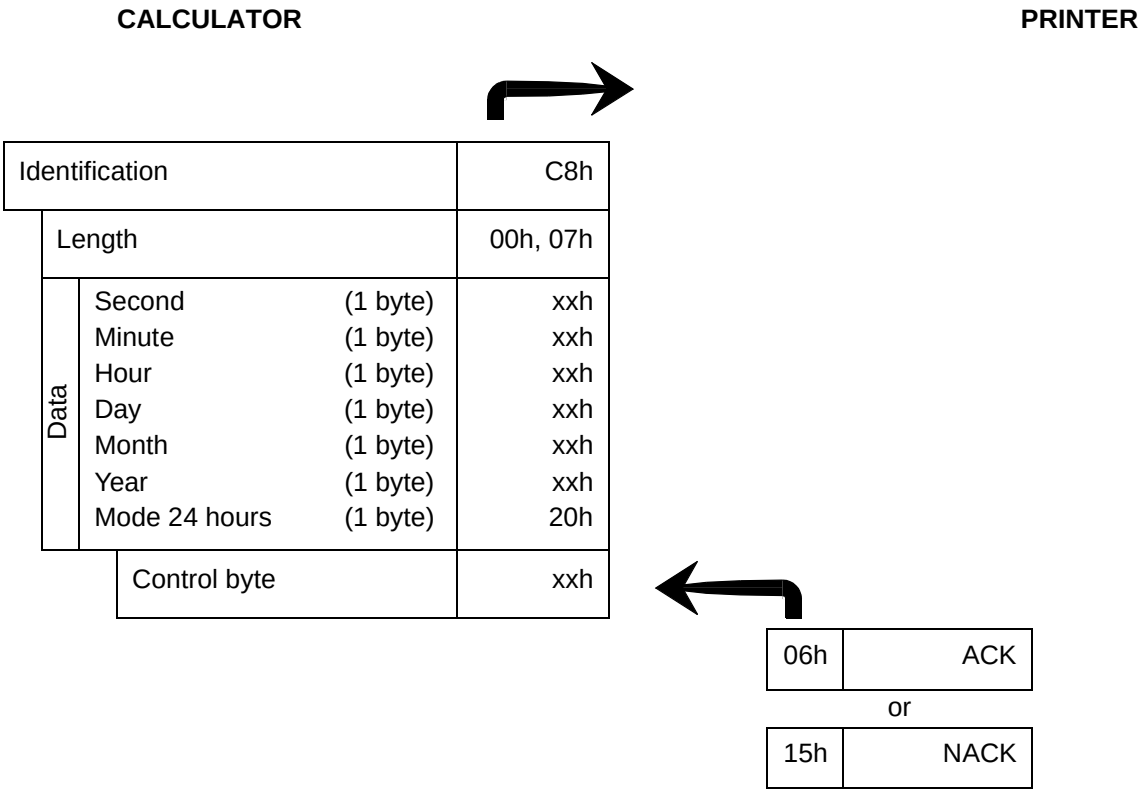


Detail of the data bytes

Jet number 1 byte				Starting time 2 bytes		Interval 2 bytes		Type code 1 byte	
Printer	Head	Jet	Jet num.	From 00 hours 00 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes		From 00 hours 01 minutes to 23 hours 59 minutes coded in hexadecimal on 2 bytes		00h = 2 figured data code FFh = alphabetical code (complete alphabet) 7Fh = alphabetical code (less O and I)	
1.1	1	1	01h						
1.2	1	1	01h						
		2	02h						
2.1	1	1	01h						
	2	3	03h						
2.2	1	1	01h						
		2	02h						
	2	3	03h						
		4	04h						
1.4	1	1	01h						
		2	02h						
		3	03h						
		4	04h						



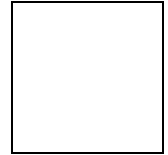
4.6 Initialisation of autoclock



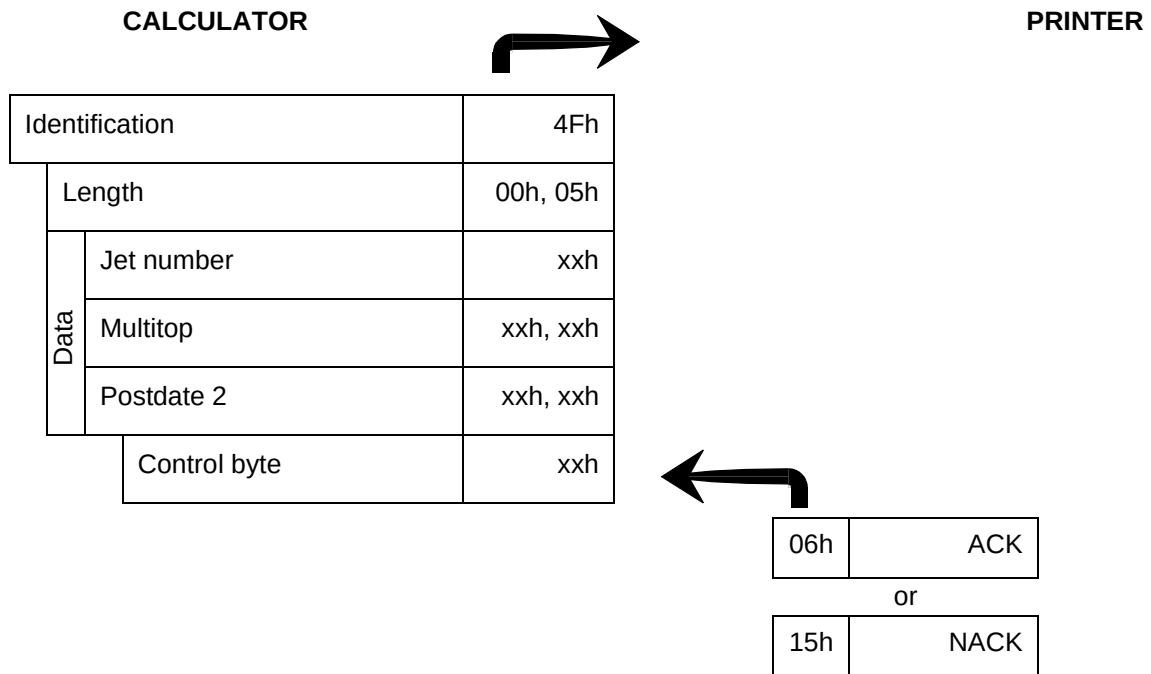
All the data bytes, except the 24h mode, are coded in BCD (Binary Coded Decimal). The units are represented by the least significant half-byte.

The minimum and maximum values of these bytes are in decimal:

- second from 00 to 59
- minute from 00 to 59
- hour from 00 to 23
- day from 01 to 31
- month from 01 to 12
- year from 00 to 99



4.7 Sending a Multitop per head and postdate 2 par jet



Detail of the data bytes

- "Multitop" bytes:

This is the number of a message to be printed per DTOP (default value = 1).
The multitop value must be identical for all the jets on a head.

It must be specific to each head in the case of 2-head printers.

The multitop value for head 1 must be entered at all the jets of the head 1.

The multitop value for head 2 must be entered at all the jets of the head 2.

- "Postdate 2" bytes: (from 0 to 9999 days) or (from 0 to 1872 months), bit 14 to bit 0
 - unit in days = 0 in bit 15
 - unit in months = 1 in bit 15

Classic printers:

The second postdate can only be accessed via V24.

It can be different for each jet but is the same for all the messages assigned to any given jet.

To obtain a different postdate 2 for another message, it is necessary to transmit the new postdate interval using the command **4Fh**.

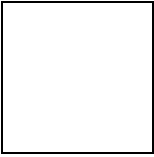
Master, IP65 and Contrast printers:

The second postdate is accessible via the printer's operator interface.

It is included in the messages and can be different for each jet and each message.

WARNING

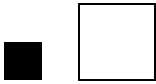
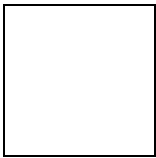
If the message is selected via the machine's parallel interface, operation remains identical to that described in the case of Classic printers.



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Contents

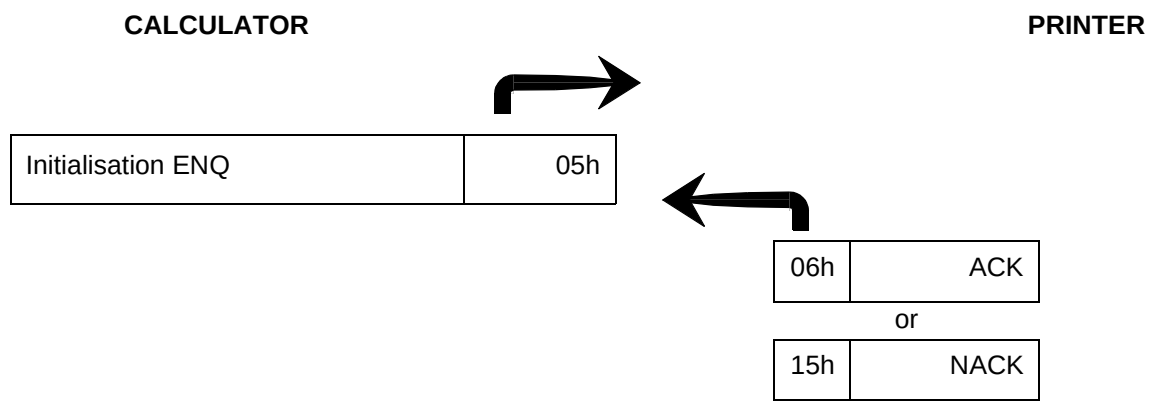
1	Requests concerning the printer	62
1.1	Request for V24 dialog	62
1.2	Request of keyboard code	63
1.3	Request for printer's parameters	64
1.4	Request for recorded operating parameters	65
1.5	Request for the status of the ink circuit electrovalves, levels, measured viscosity, reference viscosity, number of times additive has been added	67
1.6	Request for printer's CRC Proms	69
1.7	Request for printer's faults	71
1.8	Status request for S8 Contrast printers	75
2	Requests concerning the heads	77
2.1	Request for the status jet	77
2.2	Request for the jet and phase speed	78
3	Requests concerning the message	79
3.1	Request for the complete current message	79
3.2	Command of printing	81
4	Requests concerning the variable elements	82
4.1	Request for current counters	82
4.2	Request for PPP printing counter	83
4.3	Request for autoclock	84
4.4	Request for table of months and shift codes	85
4.5	Request for shift code parameters	86



1 Requests concerning the printer

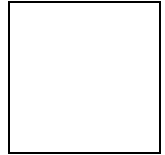
1.1 Request for V24 dialog

This request is optional. It enables the user, however, to ensure that the printer is "ready" to dialog. It can therefore be sent prior to each exchange.

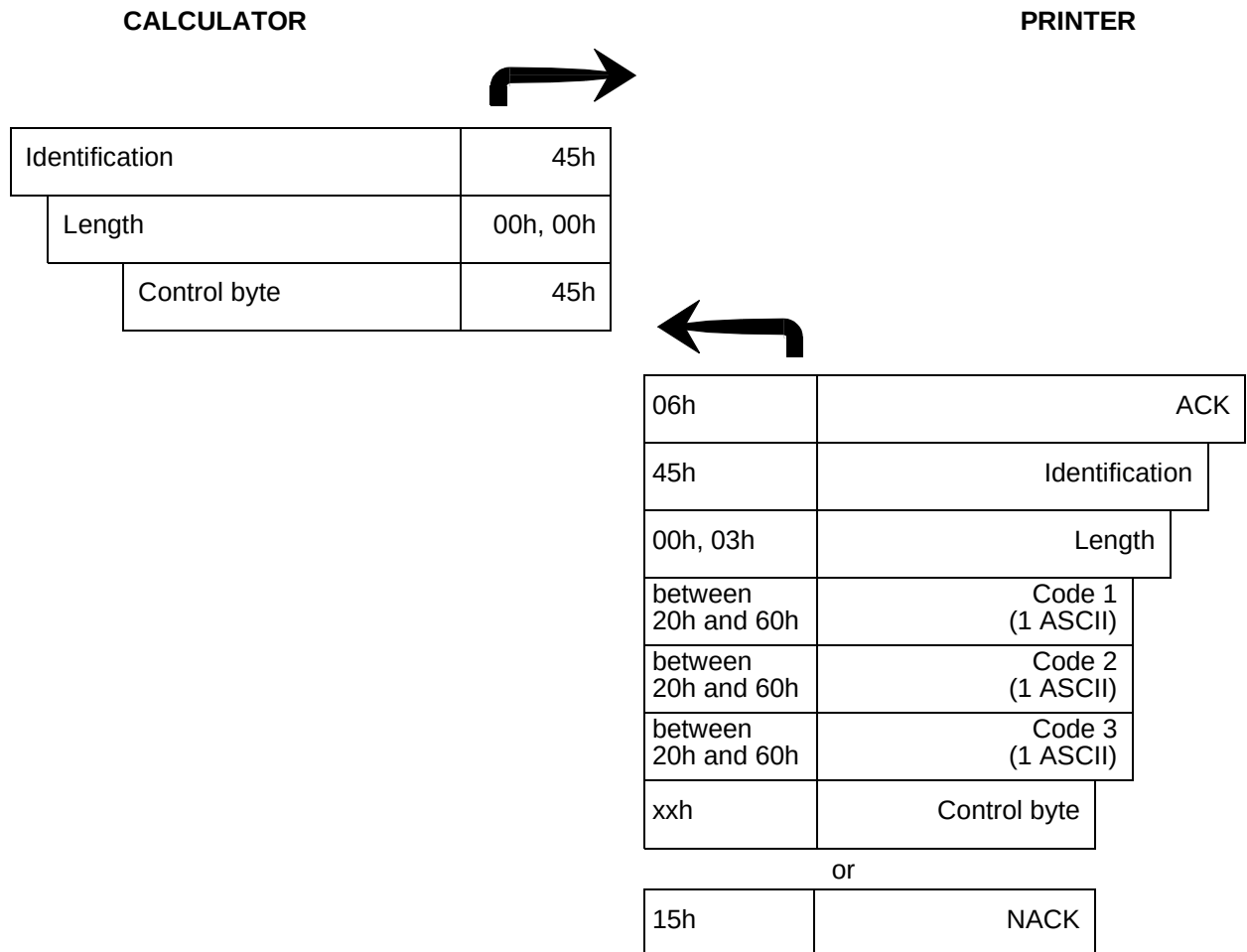


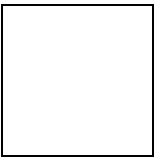
The answer from the printer is NACK:

- if the liaison is locked by the security code,
- if the menu is being modified from the keyboard.

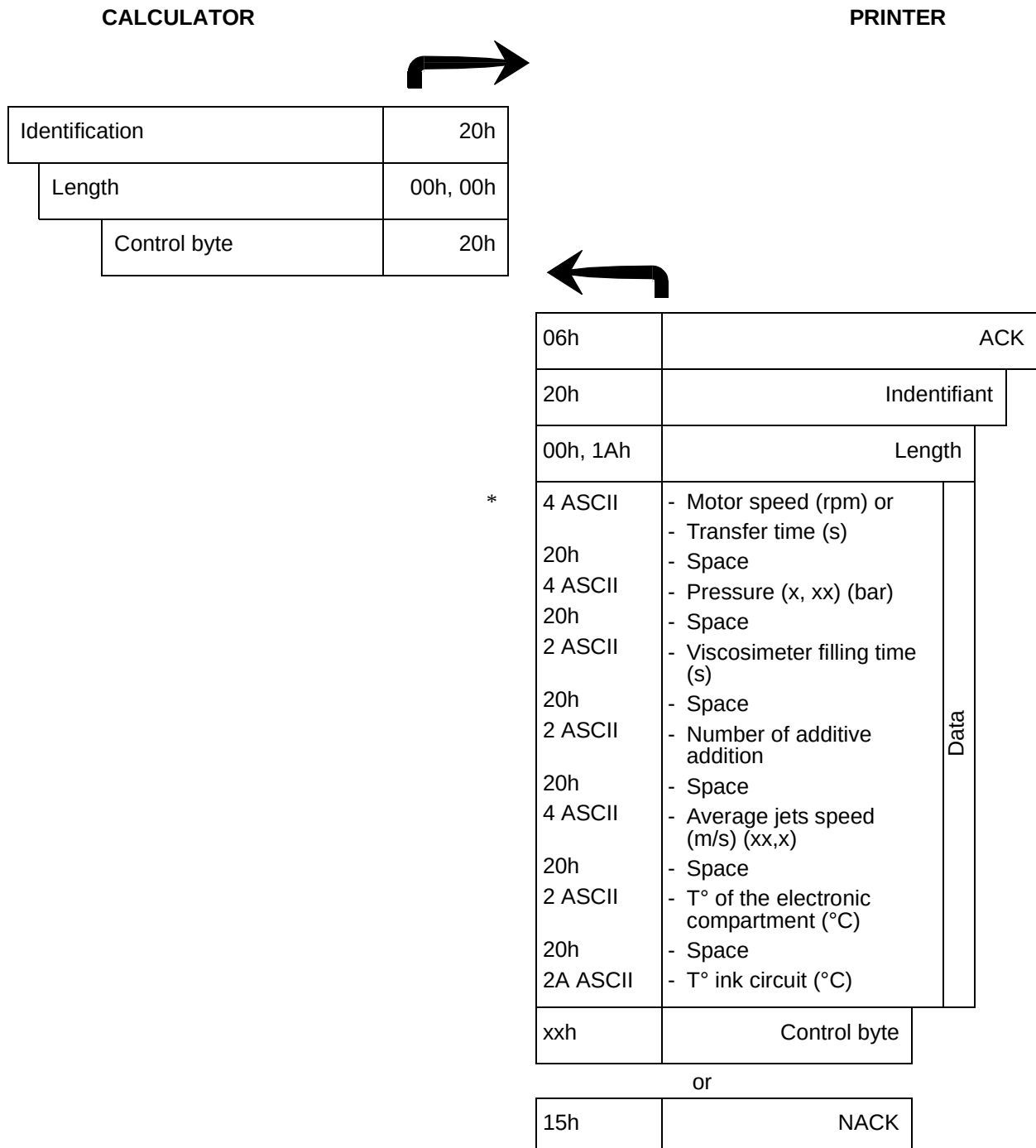


1.2 Request of keyboard code

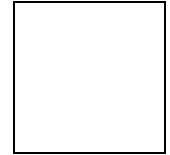




1.3 Request for printer's parameters



- * Motor speed: for Classic, Master and IP65 printers.
Transfer time: for Contrast printer.



1.4 Request for recorded operating parameters

This command only applies to Classic printers.

It is used to display a recorded log of printer operating parameters, which are recorded at five minute intervals and thus span several hours.

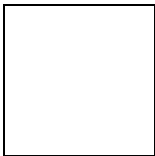
CALCULATOR

PRINTER

Identifier	44h
Length	00h, 00h
Control byte	44h



06h	ACK	
44h	Identifier	
00h, xxh	Length	
x ASCII	Recorded printer operating parameters	Data
xxh	Control byte	
or		
15h	NACK	



Operating parameters as displayed on screen

Heure	Vmot	Pres	Tr	Ad	Vjet	T1	T2	Def
05:25	1694	2,76	31	06	20,0	34	22	00
05:30	1694	2,76	31	06	20,0	34	22	00
05:35	1694	2,76	32	07	20,0	34	22	00
05:40	1694	2,80	31	08	20,0	33	21	00
05:46	1694	2,76	31	09	20,0	33	21	00
05:51	1694	2,76	31	11	20,1	34	21	00
05:56	1676	2,76	30	12	20,1	34	21	00
06:00	1630	2,76	29	13	20,2	34	22	00
06:05	1604	2,72	29	14	20,1	35	22	00
06:10	1578	2,72	28	14	20,2	35	22	00
06:15	1570	2,72	28	14	20,1	35	22	00
06:20	1570	2,72	28	14	20,1	35	22	00
06:25	1562	2,72	29	14	20,1	35	22	00
06:30	1562	2,72	28	14	20,1	36	22	00
06:37	1554	2,72	29	00	20,1	36	22	00

Detail of the data bytes

- Several hours' operation are recorded (maximum 8 kbytes).
- The parameters sent are ASCII with CR,LF at the end of each line.
- The end of the parameters is marked by byte 1Ah.

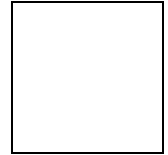
The following parameters are recorded:

- Heure: Time of record
- Vmot: Motor speed (rpm)
- Pres: Ink pressure (bar)
- Tr: Viscosity meter filling time (s)
- Ad: Number of additive additions
- Vjet: Jet speed (m/s)
- T1: Temperature of electronics (°C)
- T2: Temperature of ink circuit (°C)
- Def: Hexadecimal value of "general faults" byte

Contents of "general faults" byte:

Bit 7 ink pigment circuit fault
Bit 6 motor cycle fault
Bit 5 head 2 failure
Bit 4 head 1 failure

Bit 3 memory loss fault
Bit 2 CPU hardware fault
Bit 1 pressure fault
Bit 0 low ink level fault



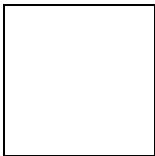
1.5 Request for the status of the ink circuit electrovalves, levels, measured viscosity, reference viscosity, number of times additive has been added

CALCULATOR

PRINTER

Identification	35h
Length	00h, 00h
Control byte	35h

06h	ACK	
35h	Identifiant	
00h, 05h	Length	
xxh	State of the ELV of the CE (1 byte)	Data
xxh	Levels (1 byte)	
xxh	Visco (s) (1 byte)	
xxh	Reference visco (s) (1 byte)	
xxh	Number of additive (1 byte)	
xxh	Control byte	
or		
15h	NACK	

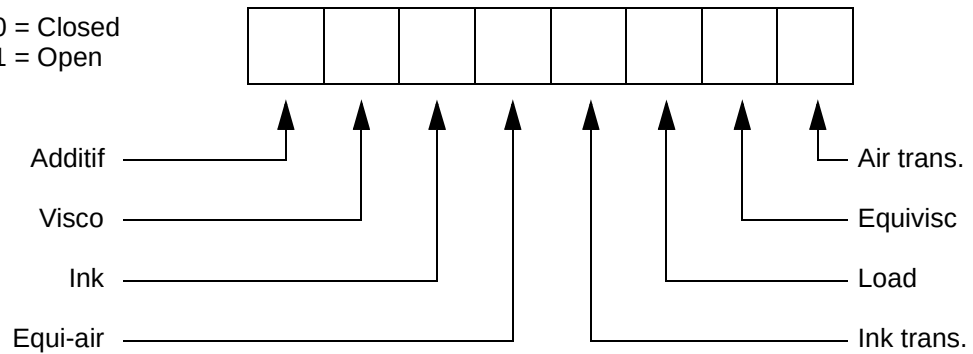


Detail of the data bytes

- Byte of the ELV of the CE :

State 0 = Closed

State 1 = Open



NOTE

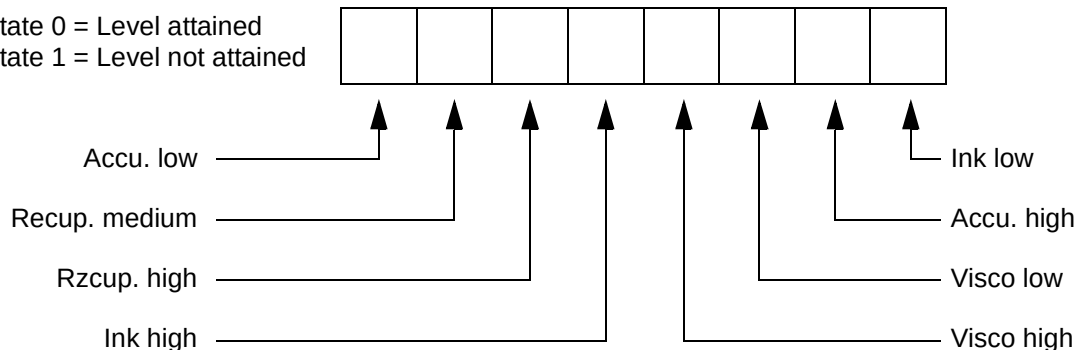
On Contrast all these solenoid valves are used.

On the other printers , only the Additive and Visco solenoid valves are used.

- Levels byte:

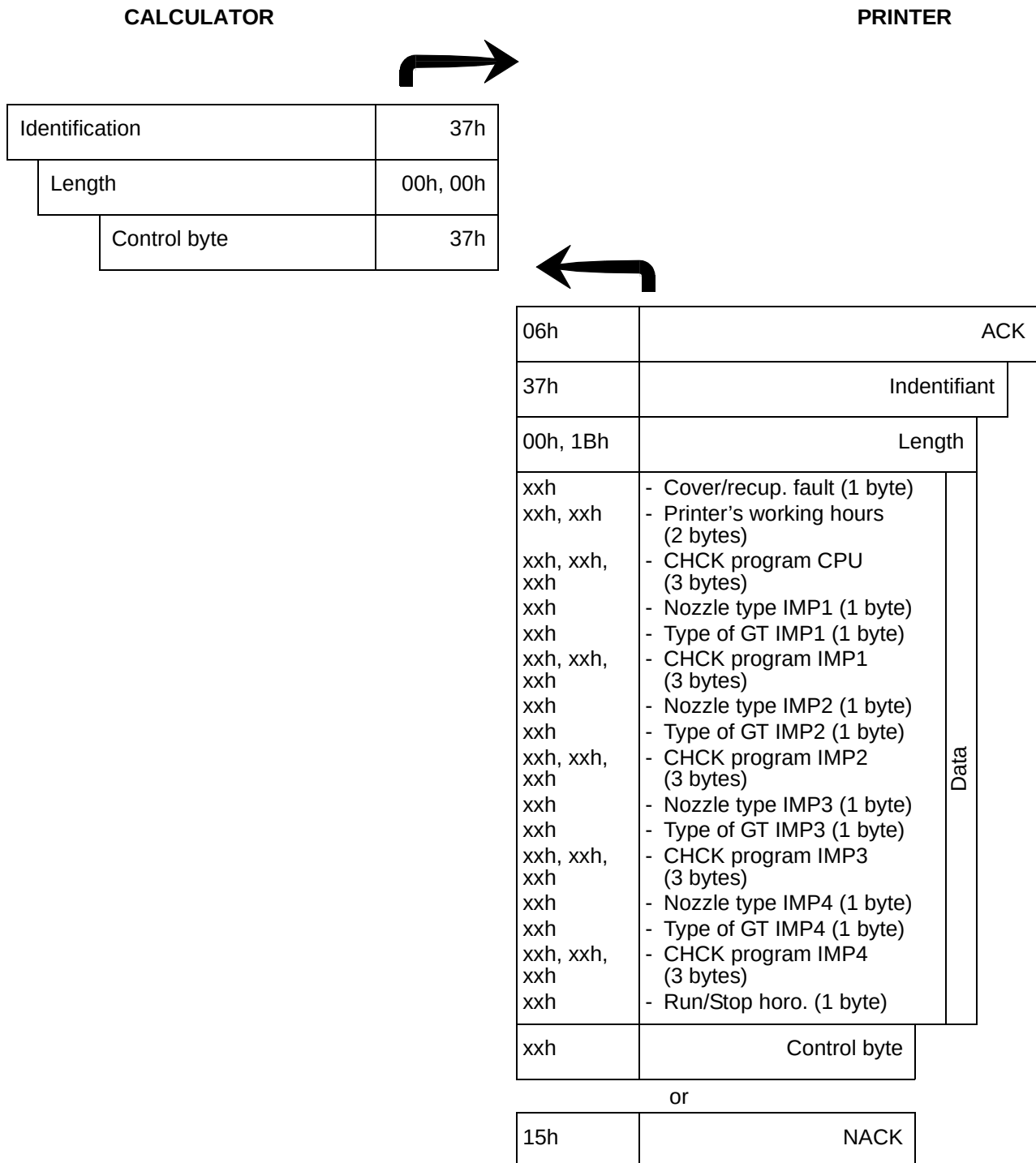
State 0 = Level attained

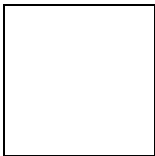
State 1 = Level not attained



- Viscosity byte:
The value represents the filling time of the viscometer in seconds, in hexadecimal coding.
- Visco reference byte:
Visco reference time in seconds, in hexadecimal coding.
- Additives byte:
Number of additions in hexadecimal coding.

1.6 Request for printer's CRC Proms





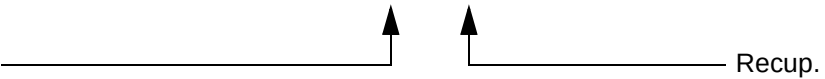
Requests to the printer

Detail of the data bytes

- Byte "Cover/recup. fault":

State 0 = active fault
State 1 = inactive fault

0	0	0			0	0	0
---	---	---	--	--	---	---	---

Cover  Recup.

- Byte "Printer's working hours":
Printer operation time is expressed in hours and coded in hexadecimal on 2 bytes.
- Byte "Nozzle type IMP":

0	0	0	0	0			
---	---	---	---	---	--	--	--

Nozzle G : 0 0 0
Nozzle M : 1 0 0
Nozzle P : 1 1 0

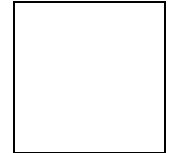
- Byte "Type of GT IMP":

--	--	--	--	--	--	--	--

State 0 = ROM
State 1 = RAM



- Byte "Run/Stop horo":
00h = Run FFh = Stop



1.7 Request for printer's faults

This command does not cancel the faults.

CALCULATOR

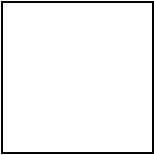
PRINTER

Identification	3Bh
Length	00h, 00h
Control byte	3Bh



06h	ACK		
3Bh	Indentifiant		
00h, 11h	Length		
xxh xxh xxh	Faults - General - Hard (CPU) - Printer - Hard IMP jet 1 - IMP jet 1 - Head jet 1 - Hard IMP jet 2 - IMP jet 2 - Head jet 2 - Hard IMP jet 3 - IMP jet 3 - Head jet 3 - Hard IMP jet 4 - IMP jet 4 - Head jet 4 - Phase - Sub-phase or solvent fault		Data
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh xxh xxh			
xxh	Control byte		
or			
15h	NACK		

* Sub-phase: for S8 Contrast printer
Solvent fault: for other printers.



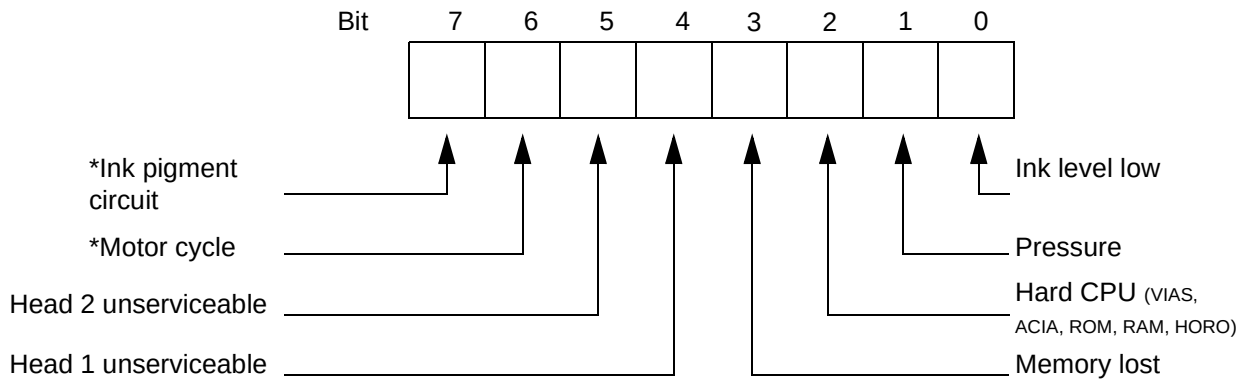
Requests to the printer

Detail of the data bytes

- Byte: message general parameters

State 0 = no fault

State 1 = fault

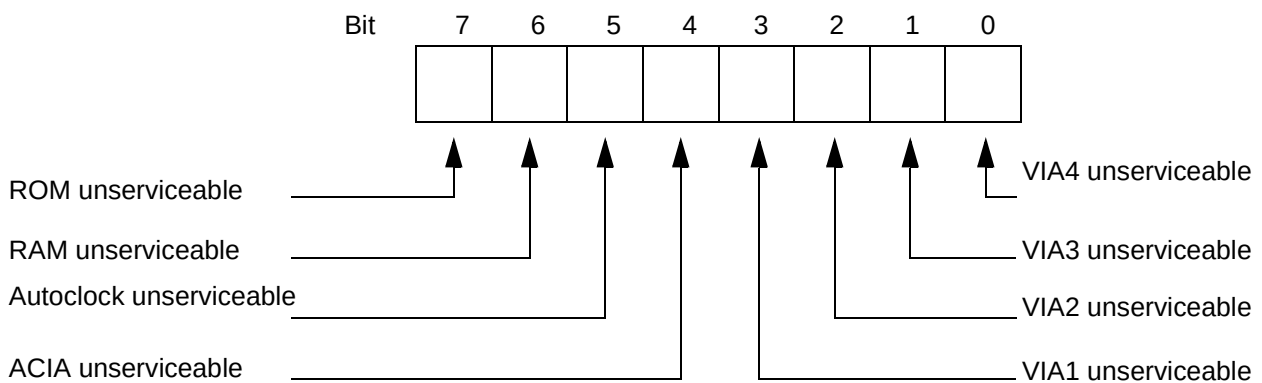


- * The bit 7 is significant on Contrast printers only.
- * The bit 6 is not significant on Contrast printers only.

- Byte: Hard fault (CPU)

State 0 = no fault

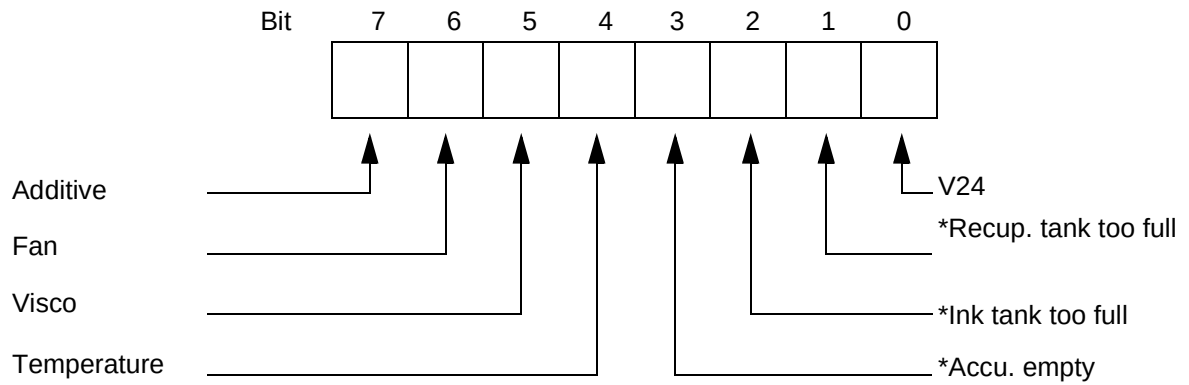
State 1 = fault



- Byte: printer's faults

State 0 = no fault

State 1 = fault

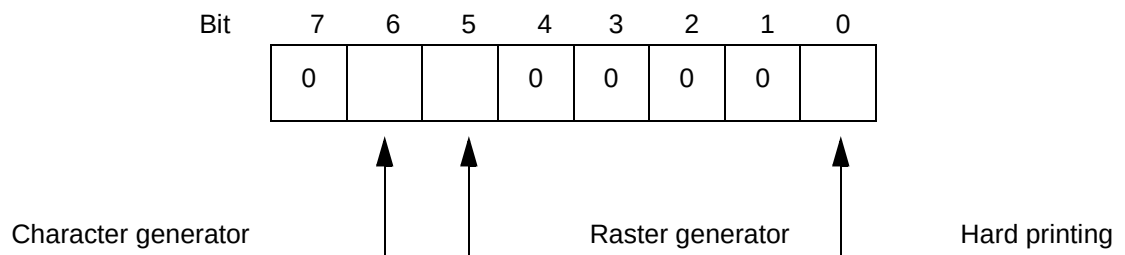


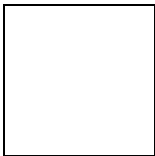
* The bits 1, 2 and 3 are significant on Contrast printers only.

- Byte: Hard fault IMP jet

State 0 = no fault

State 1 = fault



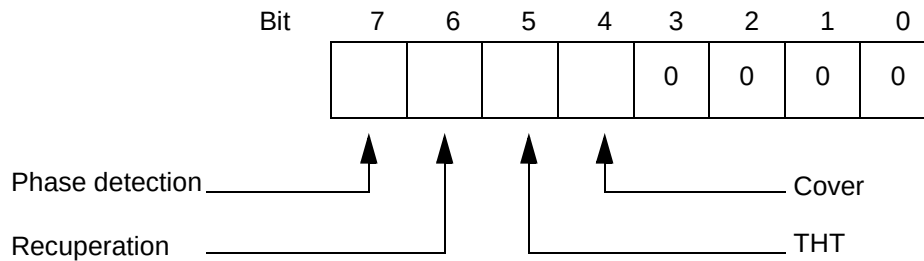


Requests to the printer

- Byte: IMP jet fault

State 0 = no fault

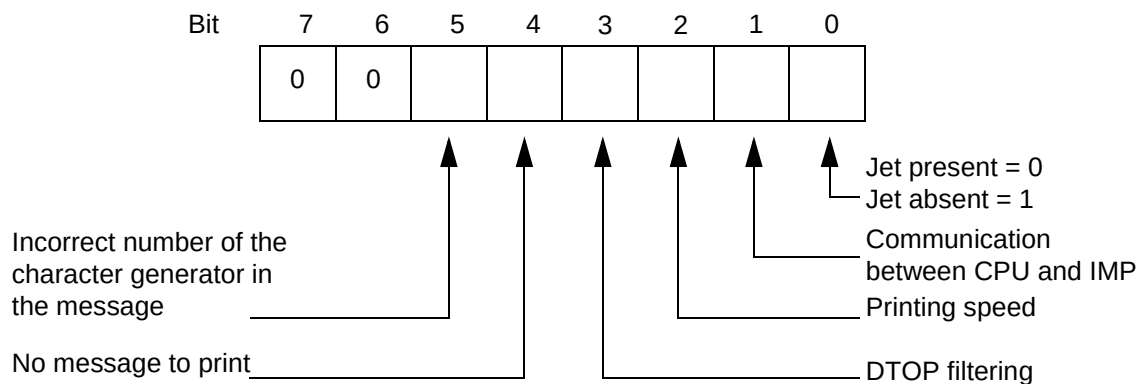
State 1 = fault



- Byte: Head fault

State 0 = no fault

State 1 = fault



- Byte: phase (Contrast printers only)

→ Nr of the phase at fault

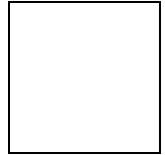
- Byte: Sub-phase or solvent fault

- sub-phase on Contrast printer
→ number of faulty sub-phase

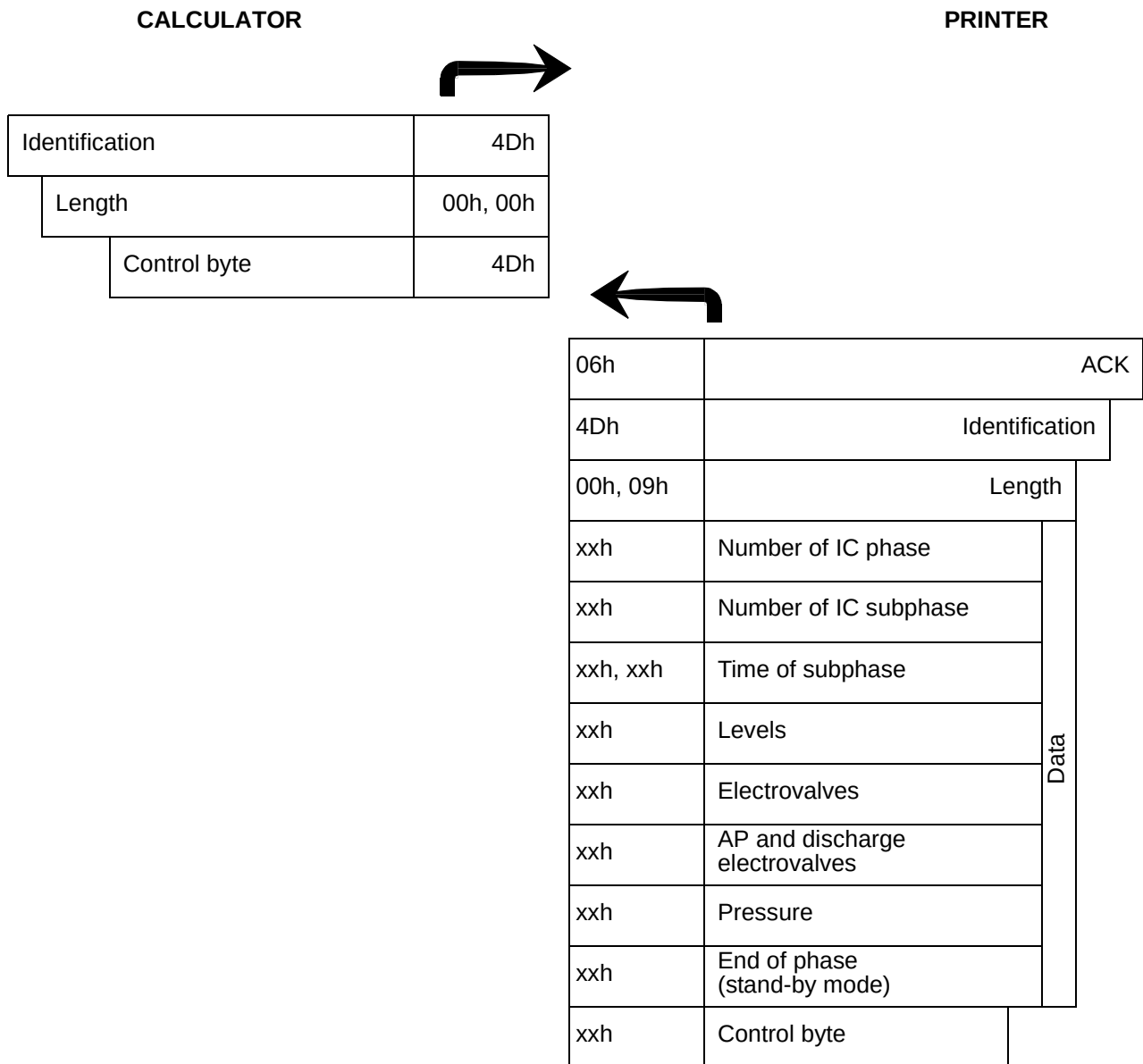
- solvent fault on other printers

Bit 3: viscosity exceeds set point by more than 8 seconds

Bit 2: additive level low. No longer linked to viscosity.



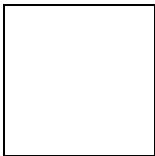
1.8 Status request for Contrast printers



Details of the data bytes

- "Subphase time" bytes:

Time expressed in tenths of a second in two bytes.

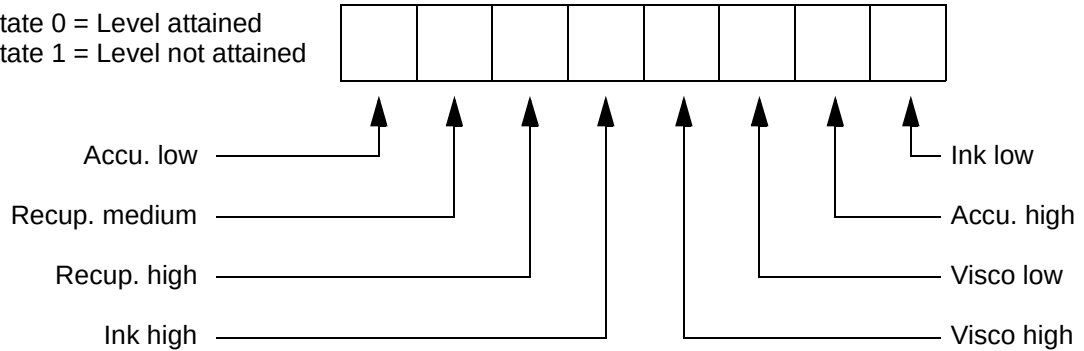


Requests to the printer

- Levels byte:

State 0 = Level attained

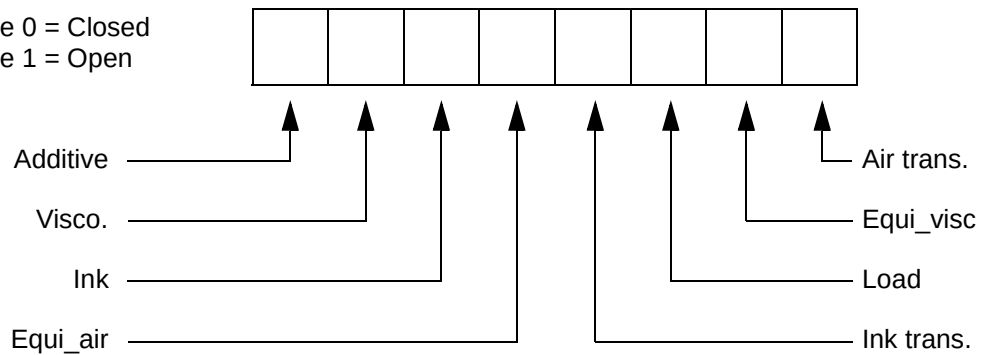
State 1 = Level not attained



- Byte of the ELV of the IC:

State 0 = Closed

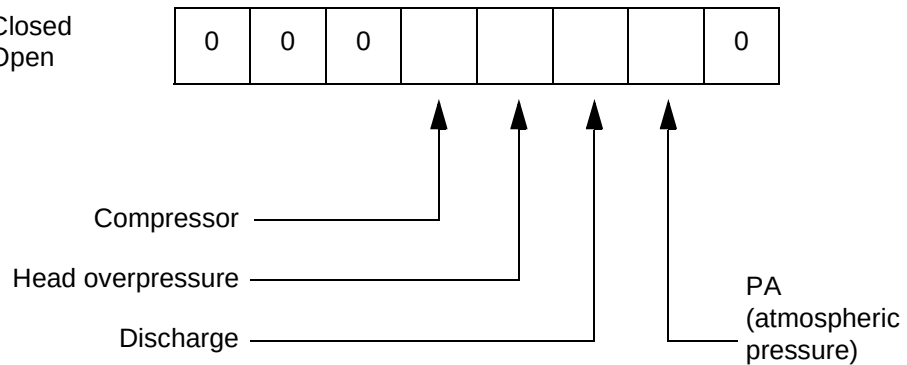
State 1 = Open



- Byte of the AP and discharge electrovalves:

State 0 = Closed

State 1 = Open



- "Pressure" byte:

The printer sends one hexadecimal byte, representing the pressure in decimal.

Calculation of the pressure in millibars:

- pressure in decimal x 19.6 for heads M/G.

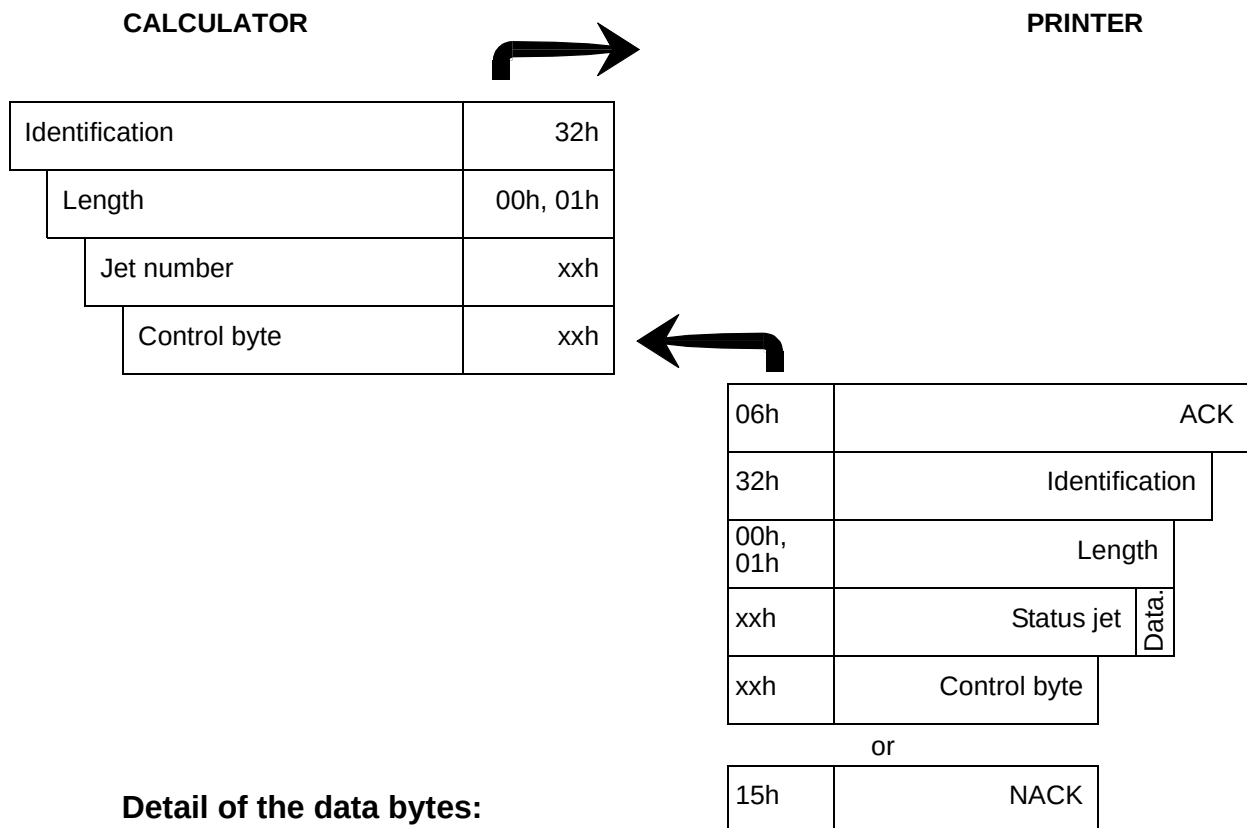
- "End of phase" byte: (stand-by mode)

00h, for active phase.

FFh, for end of phase.

2 Requests concerning the heads

2.1 Request for the status jet



Detail of the data bytes:

- Byte "Jet number":

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

- Byte "Status jet":

00h = Jet halted

01h = Jet in start-up phase

02h = Jet in refreshment

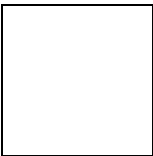
03h = Jet in stability check

04h = Jet in solution introduction

05h = Jet in nozzle unblocking

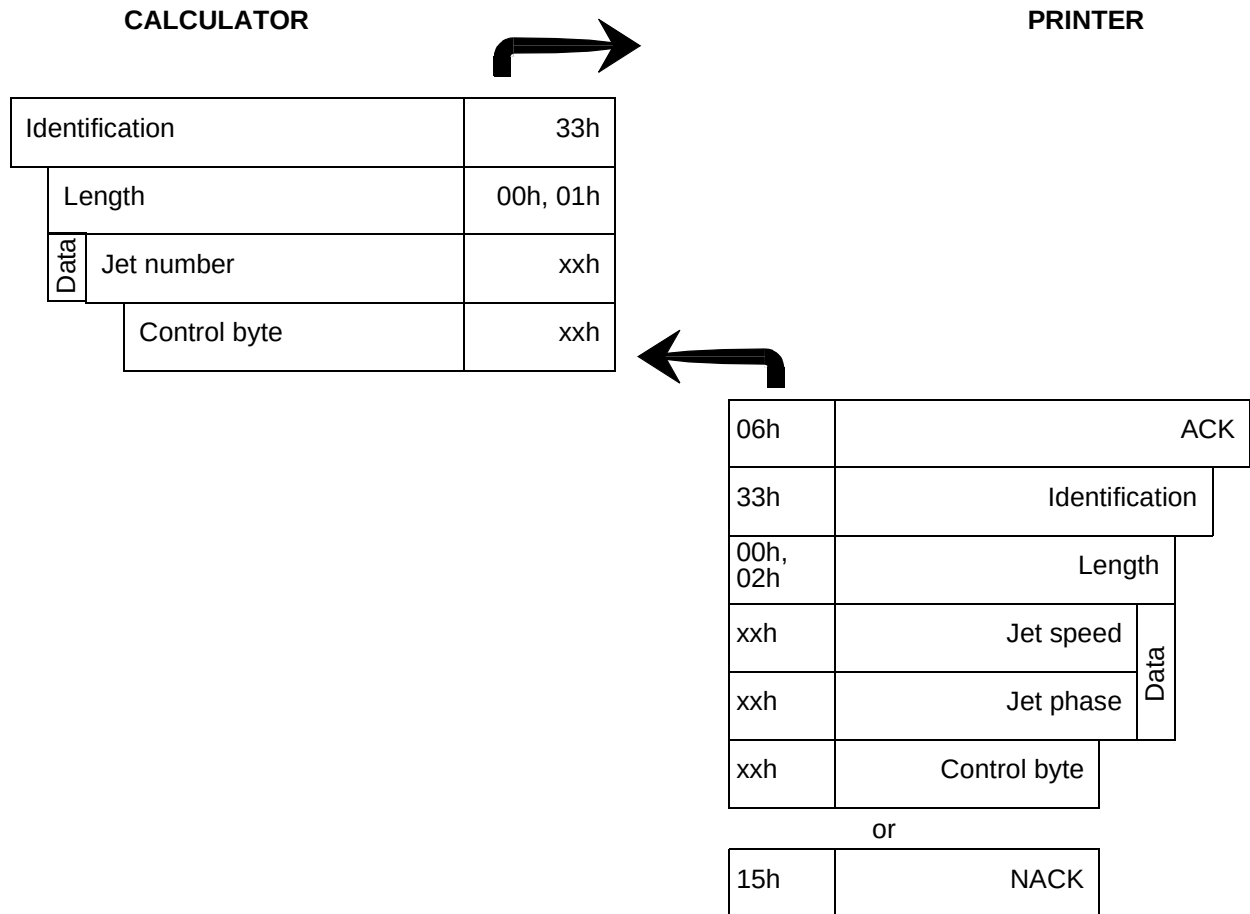
06h = Setting

07h = Jet running



Requests to the printer

2.2 Request for the jet and phase speed



Detail of the data bytes:

- "Jet number" byte:

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h

- "Jet speed" byte:

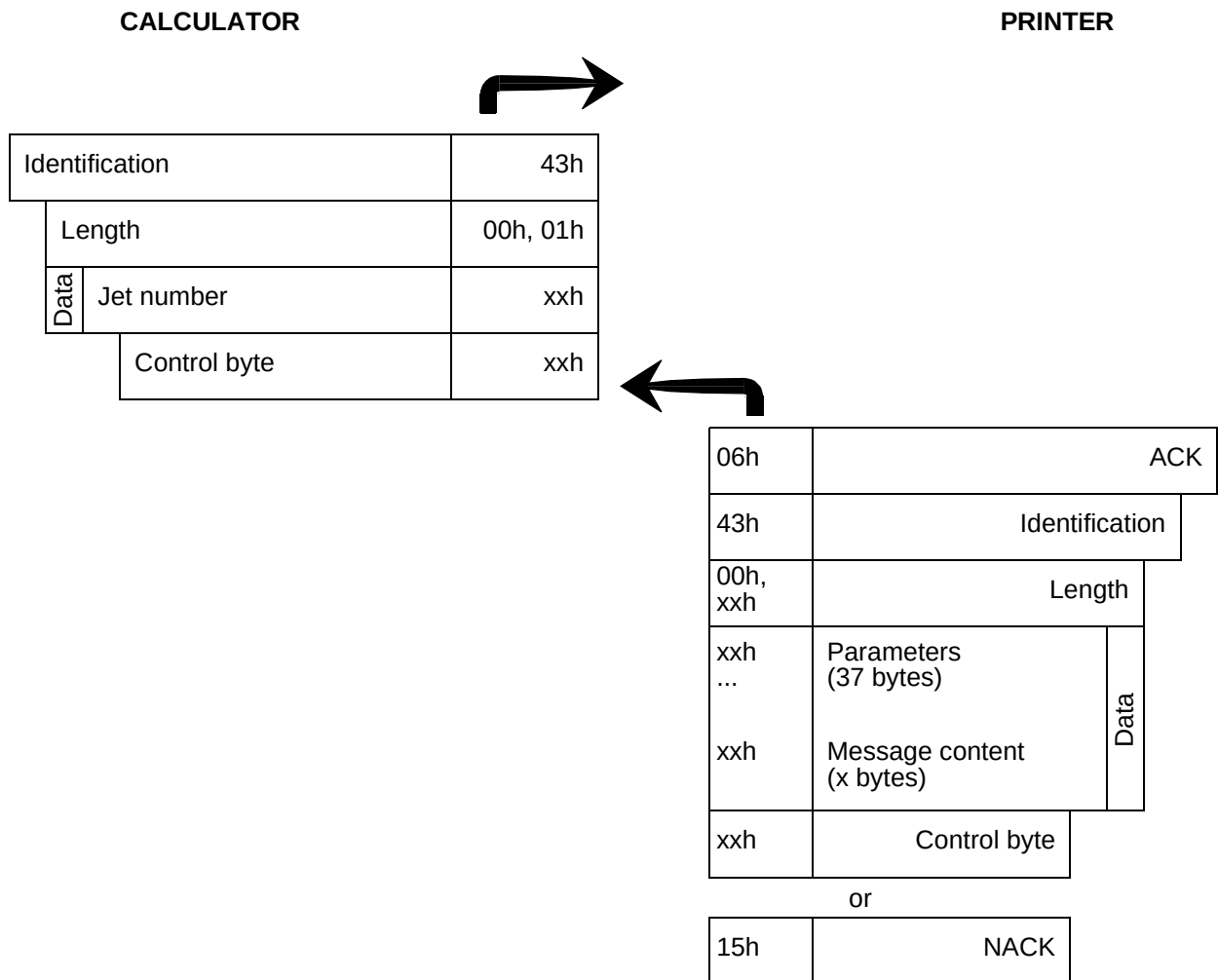
The jet speed is expressed in tenths of a metre per second, coded in hexadecimal on 1 byte.

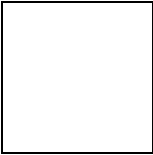
- "Jet phase" byte:

8 bits that can each take value 0 or 1.

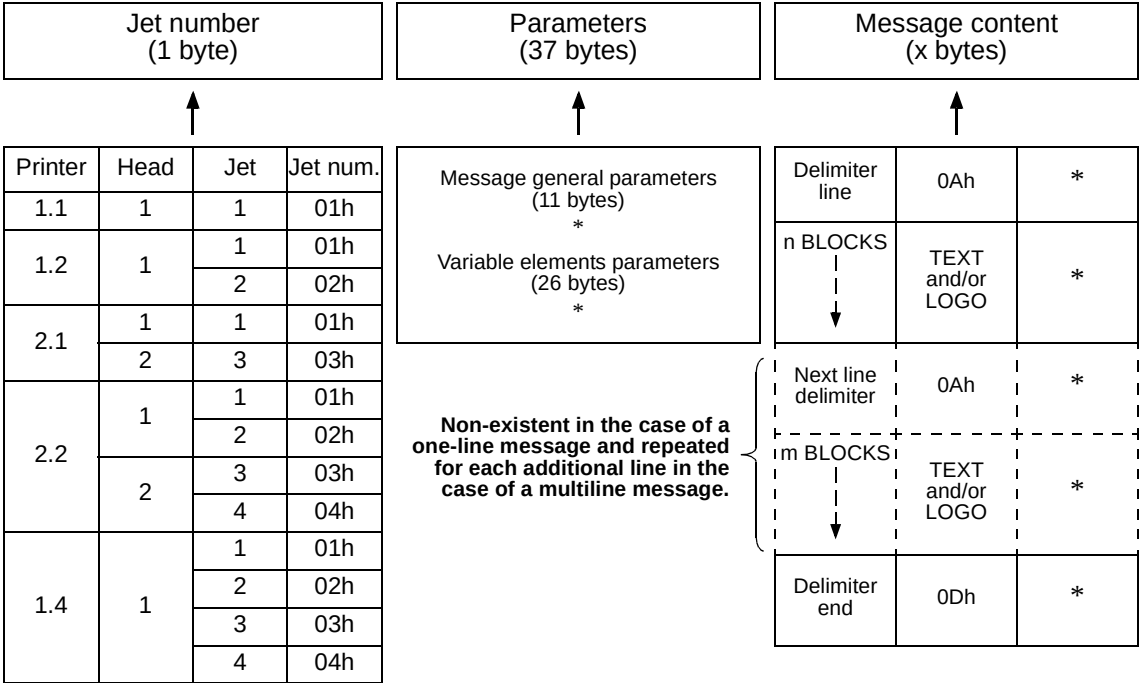
3 Requests concerning the message

3.1 Request for the complete current message

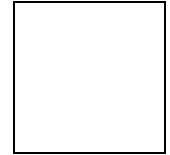




Detail of the data bytes

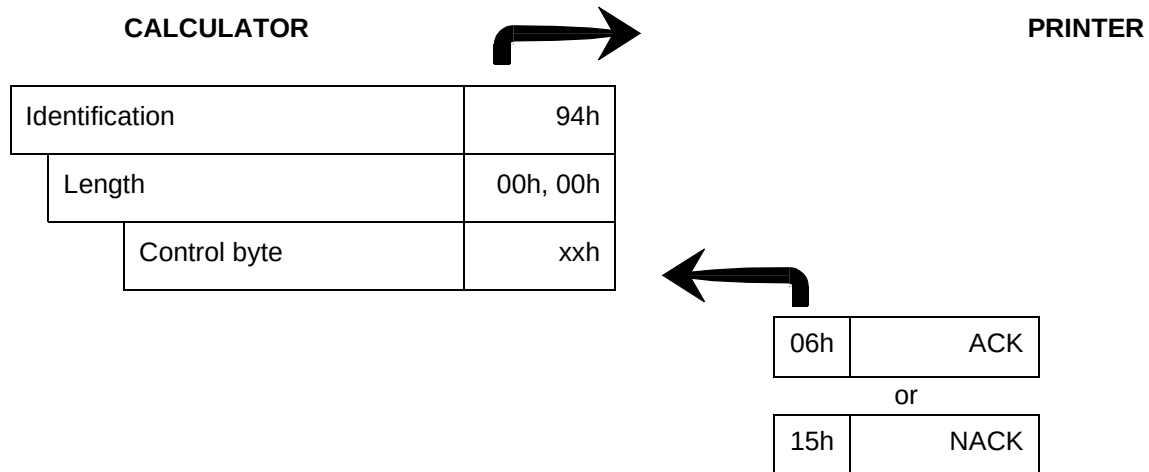


* See section "Précise details about the data bytes"



3.2 Command of printing

This command orders printing to the head(s). The printer should be configured in manual auto or manual object.



The response ACK is delivered if printing is effectively commanded (no verification of the printing done is carried out).

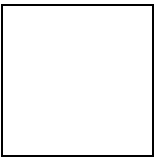
The response NACK signifies:

- the printing mode is different of the object manual or the auto manual,
- the printing has not started.

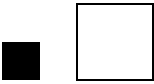
NOTE

In "object manual" mode a single printing is triggered by this command.

In "auto manual" the first command triggers the printing, the message is repeated until a second command stops the printing.

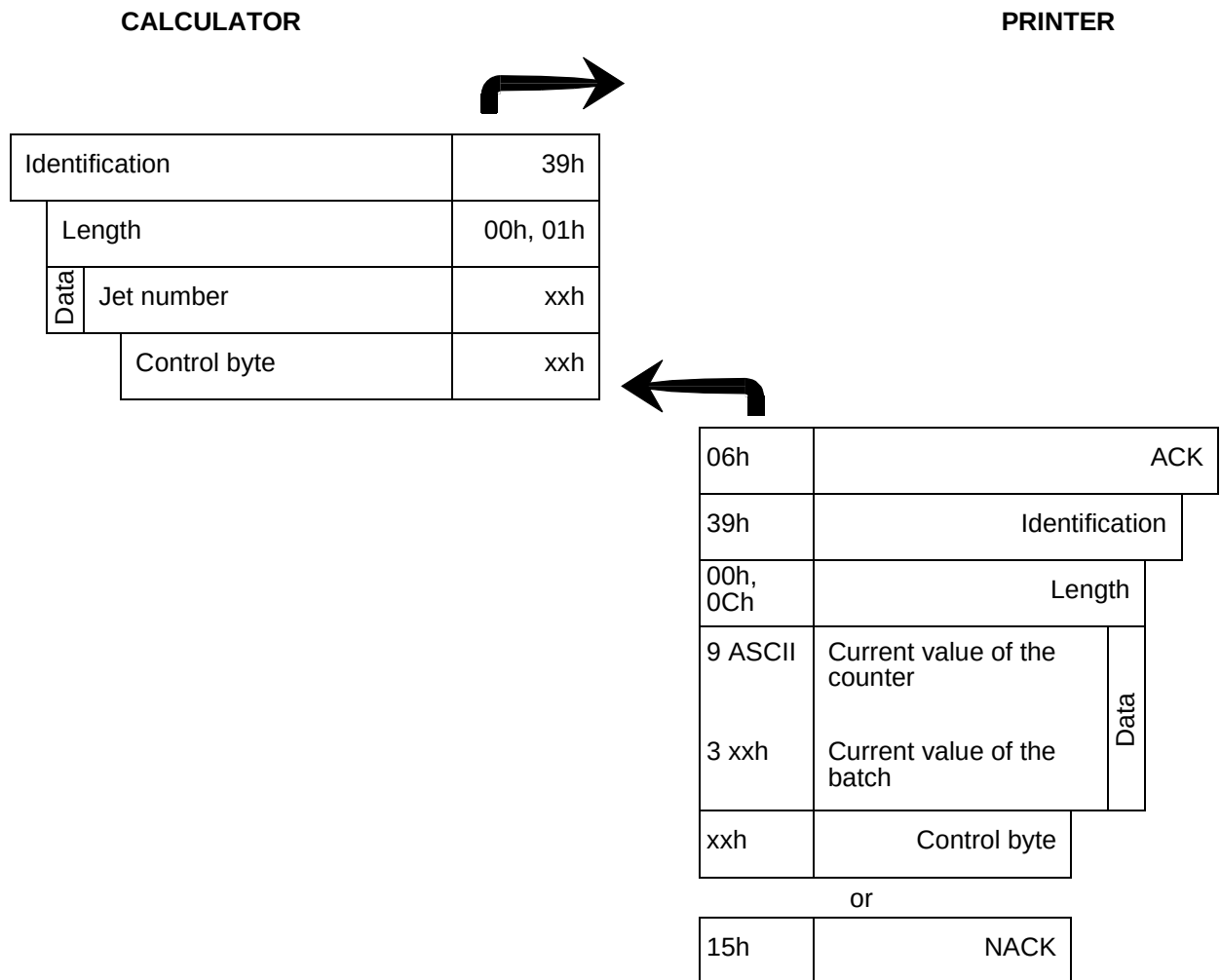


Requests to the printer



4 Requests concerning the variable elements

4.1 Request for current counters

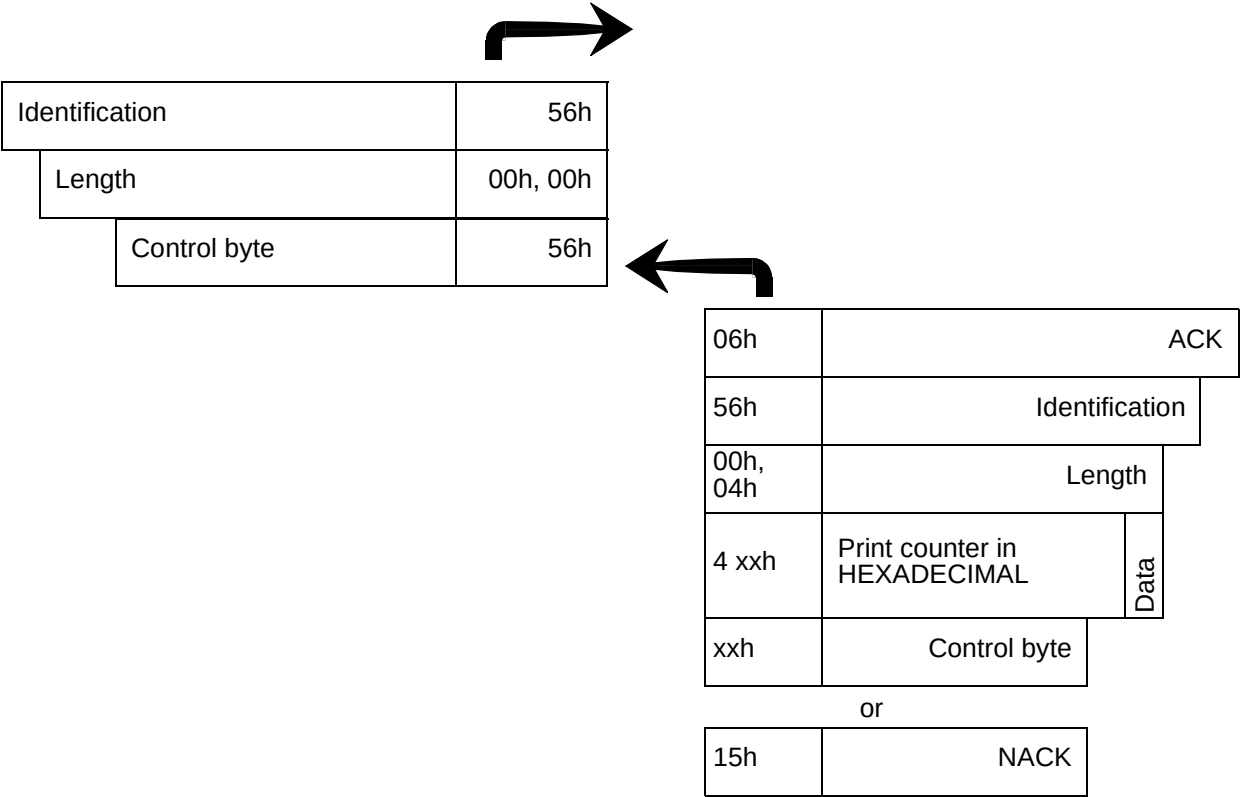


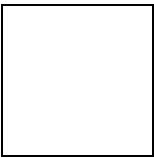
4.2 Request for PPP printing counter

This command only applies to printers with the Pay per print option installed.

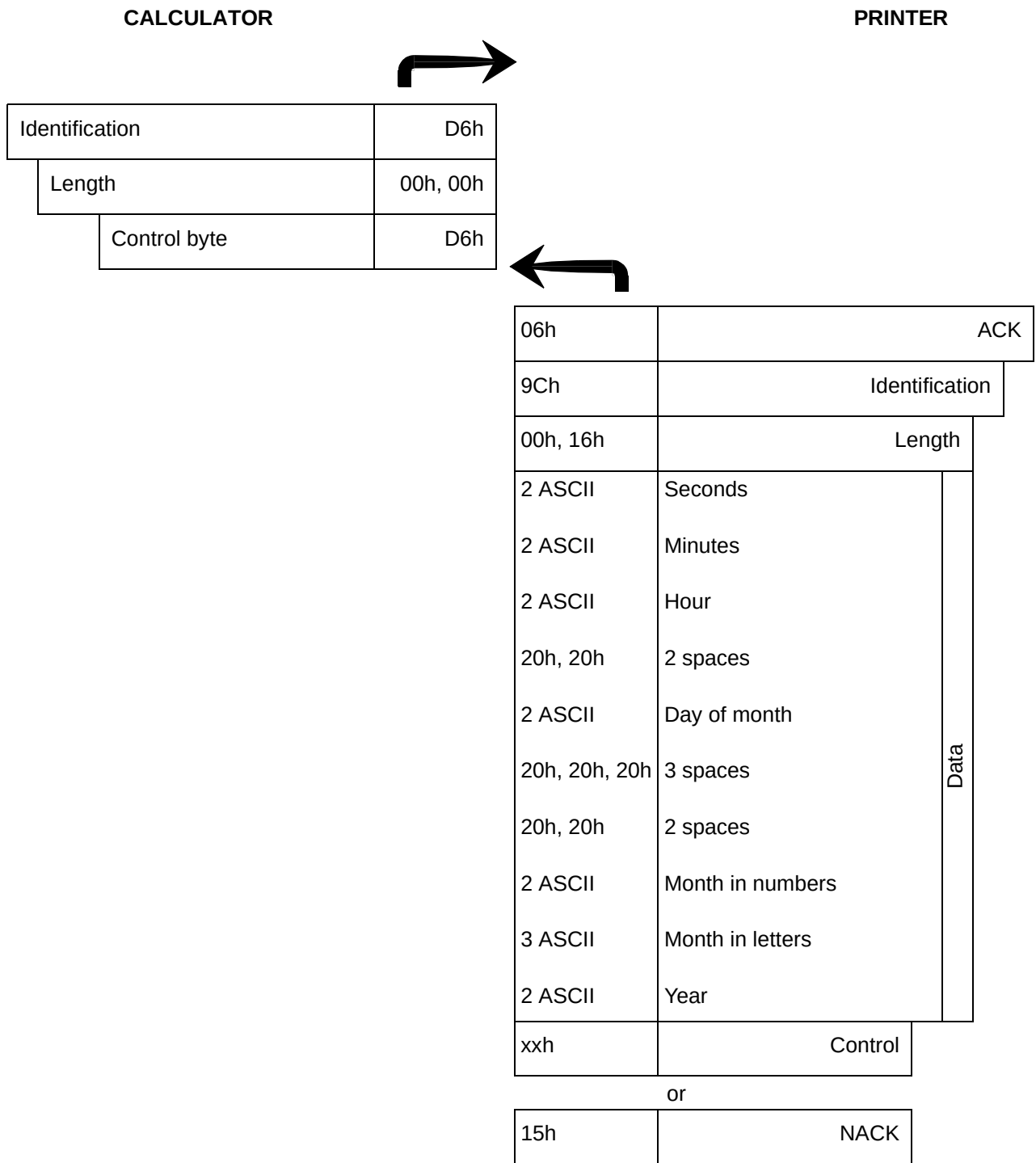
CALCULATOR

PRINTER

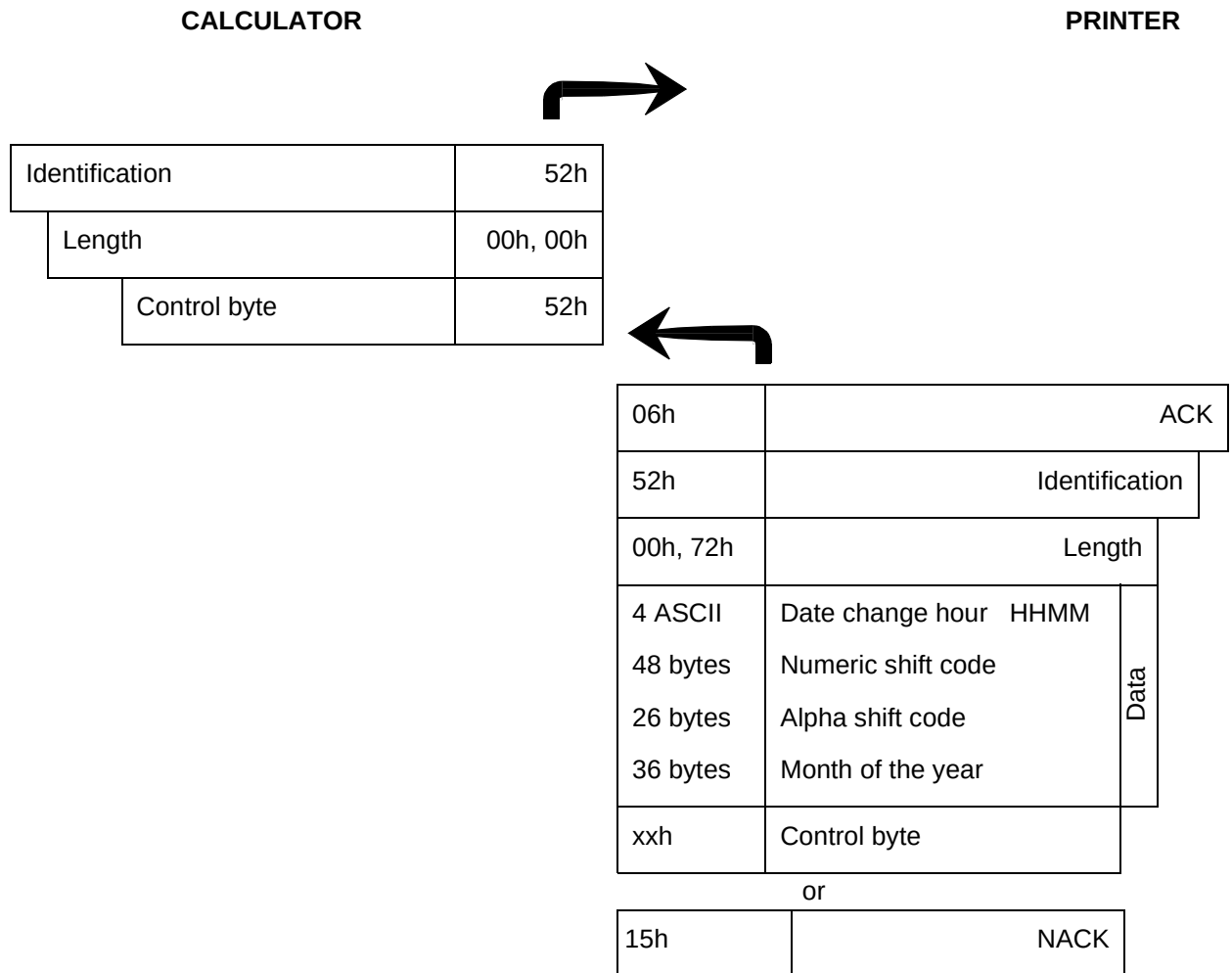




4.3 Request for autoclock

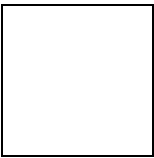


4.4 Request for table of months and shift codes

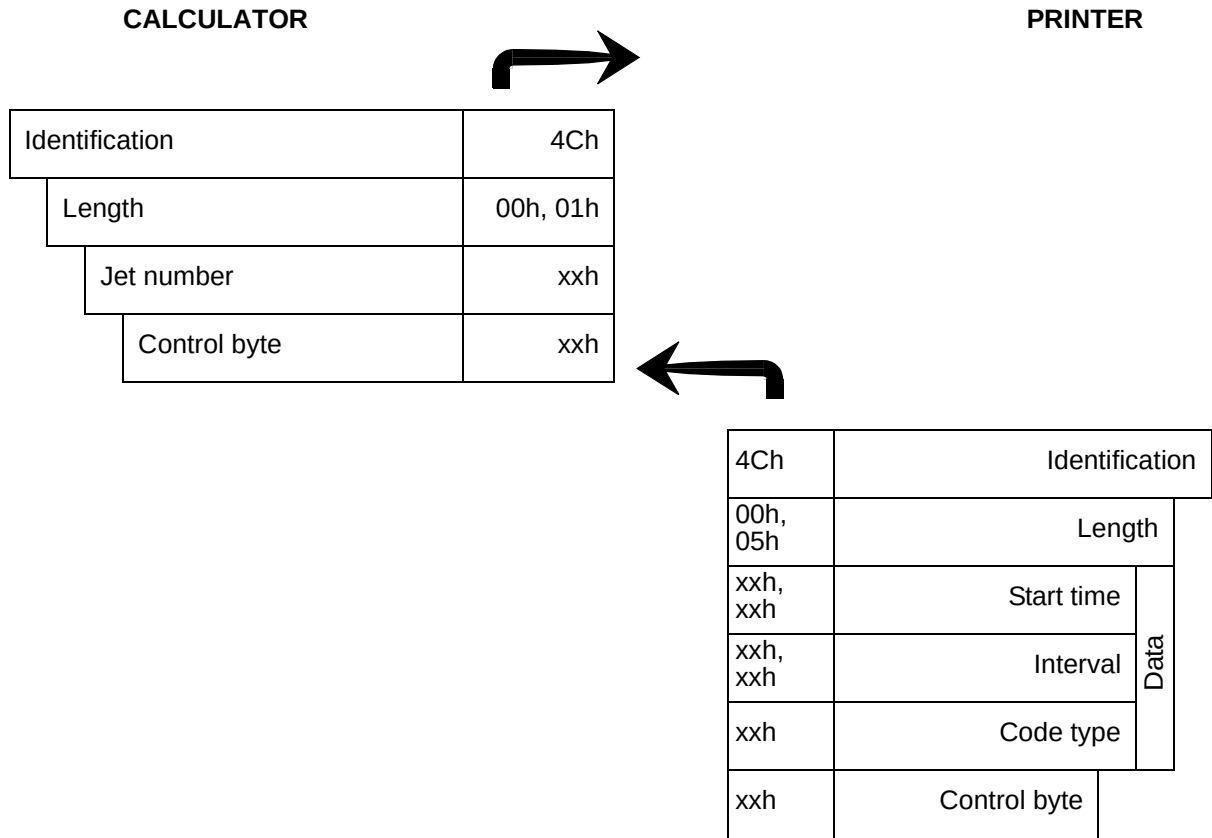


Detail of the data bytes

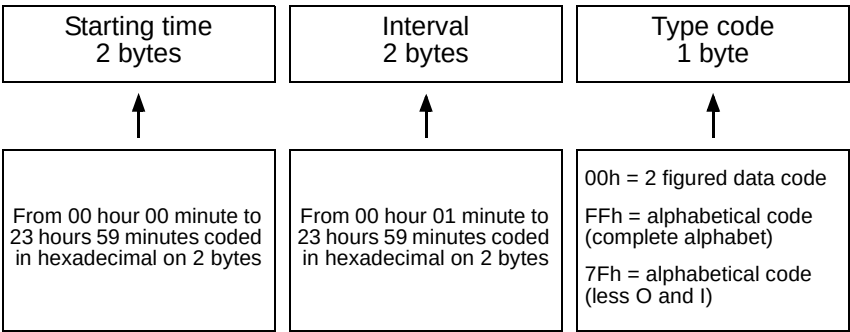
- "Date change hour" bytes:
HHMM in ASCII.
- "Numeric shift code" bytes: 24 codes of any two characters:
01-02-03-04-05-06-07-08-09-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24
- "Alpha shift code" bytes: 26 codes of any single character:
A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-S-T-U-V-W-X-Y-Z
- "Month of the year" bytes: 12 codes of any three characters:
JAN-FEV-MAR-AVR-MAI-JUN-JUI-AOU-SEP-OCT-NOV-DEC



4.5 Request for shift code parameters

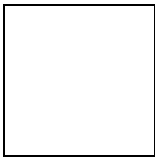


Detail of the data bytes

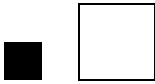


Contents

1	Jet number: from 1 to 4 (1 byte in hexadecimal)	88
2	General parameters of a message (11 bytes)	88
3	Parameters of variable elements (counter/horodator) (26 bytes)	89
4	Delimiter of beginning of line: (0Ah)	89
5	Block/Text	90
5.1	Bolderization	90
5.2	Symbol Generator	90
5.3	Detail of TEXT	93
6	Logo block/symbol	99
6.1	Classic printer	99
6.2	S8 Master, S8 IP65 and S8 Contrast printers	99
7	Delimiter of end of message	99
8	General message structures	100
8.1	General structure of a one-line message	100
8.2	General structure of a two-line message	100
8.3	General structure of a three-line message	100
8.4	General structure of a four-line message	100

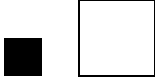


Precise details about the data bytes



1 Jet number: from 1 to 4 (1 byte in hexadecimal)

Printer	Head	Jet	Jet num.
1.1	1	1	01h
1.2	1	1	01h
		2	02h
2.1	1	1	01h
	2	3	03h
2.2	1	1	01h
		2	02h
	2	3	03h
		4	04h
1.4	1	1	01h
		2	02h
		3	03h
		4	04h



2 General parameters of a message (11 bytes)

Message sense	0 = normal	/	1 = inverted	b7	1 byte
Horizontal sense of the characters	0 = normal	/	1 = inverted	b6	
Vertical sense of the characters	0 = normal	/	1 = inverted	b5	
Tachometer mode	0 = no	/	1 = yes	b4	
Manual mode	0 = no	/	1 = yes	b3	
Command mode	0 = object	/	1 = repetitive	b2	
NU	0			b1	
Mode DIN	0 = no	/	1 = yes	b0	2 bytes
Printing speed in mm/s or tachometer division	(2 bytes binary)				
Forward margin in mm	(2 bytes binary)				8 bytes
Return margin in mm	(2 bytes binary)				
Interval in mm	(2 bytes binary)				
Object top filter in µsec	(2 bytes binary)				

Minimum and maximum values of the general parameters:

Printing speed	0001 to 9999 mm/s
Tachometer division	0001 to 9999
Forward margin	0001 to 9999 mm
Return margin	0001 to 9999 mm
Interval margin	0001 to 9999 mm
Filtering	0100 to 9999 µs

3 Parameters of variable elements (counter/horodator) (26 bytes)

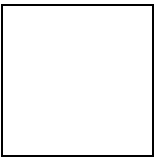
Printing of leading zeros	0 = no	/	1 = yes	b7	1 byte	
Counter incrementing on	0 = object	/	1 = message	b6		
Reset of object top counter	0 = no	/	1 = yes	b5		
Increasing/decreasing	0 = inc.	/	1 = dec.	b4		
Number of figures printed 1 to 9 (4 bytes)				b3 to b0		
Initial value	(9 bytes ASCII)			23 bytes		
Final value	(9 bytes ASCII)					
Step counter	(2 bytes ASCII)					
Lot counter	(3 bytes binary)					
Postdate	unit	0 = day	/	1 = month	b15	2 bytes
	interval	in days =	or	in months	b14 to b0	

Maximum and minimum values of the variable elements: (in decimal)

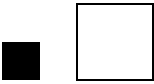
Initial value	000000000 to 999999999
Final value	000000000 to 999999999
Increase step counter	01 to 99
Lot counter	000001 to 999999
Postdate interval	0000 to 9999 days or 0000 to 1872 months

4 Delimiter of beginning of line: (0Ah)

This delimiter is the same for all lines.



Precise details about the data bytes



5 Block/Text

Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	TEXT
--	-----------------------------------	------

5.1 Bolderization

From 1 to 9 (1 byte hexadecimal).

5.2 Symbol Generator

5.2.1 On Classic printer

The symbol generators accessible in the printer can be visualised on the display of the printer.



WARNING

The symbol generator numbers are different on line 1 and 2. Display each number on the corresponding line.
The symbol generator numbers 255 to 241 are reserved for logos.

Example:



1	◆	◆	
---	---	---	--



L 07 x 06 052			
---------------	--	--	--

GS number line 1



1	◆	◆	
---	---	---	--

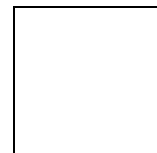


2	◆	◆	
---	---	---	--



L 07 x 06 053			
---------------	--	--	--

GS number line 2



5.2.2 On Master, IP65 and Contrast printers

The symbol generators are designated by a name. This name corresponds to a number which you can find in one of the tables below.

Table 1

Fonts name	No
ARA16139	065
ARA24139	099
CYR16109	068
CHE5_1	58
CHE7_1	60
DAMIER	254
DI24_036	027
DS24_036	028
GRE16117	071
GRE24117	077
HEB16BAM	74
HEB24BAM	78
IG11_135	040
IG11_136	140
IGG11135	041
IN16_135	018
J1000	255
NY16_135	008
OC11_088	098
OC11_135	031
OC16_061	034
OC16_095	033
OC16_136	032
OC16_ITF	146
OCG11136	042
OCNU_ITF	147
OCR09_P1	144
PARAL	253
SCI11119	075
SCI16119	062
SIN09110	079
SIN11118	054
SIN16119	056
SIN24058	057

NOTE

**A maximum of 15 fonts can be downloaded to the printer interface.
A maximum of 10 fonts can be used simultaneously in a message.**

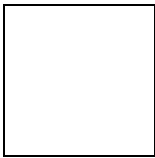
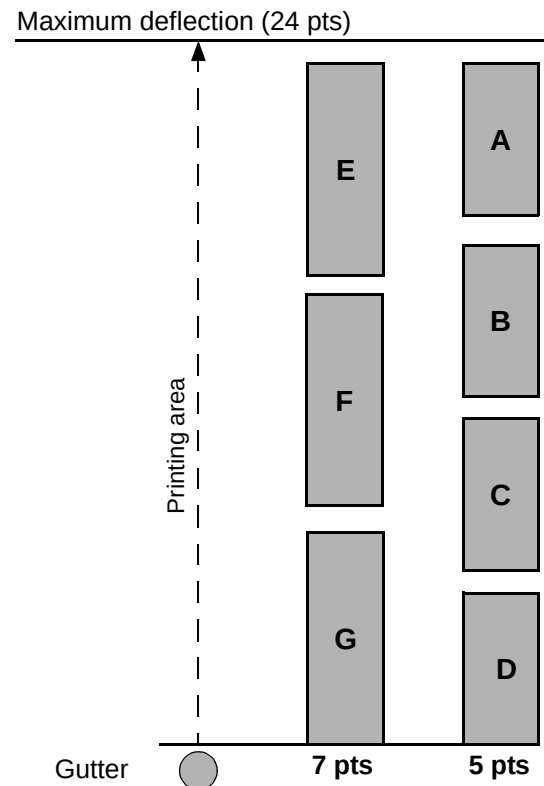
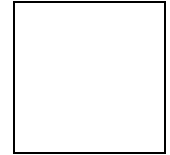


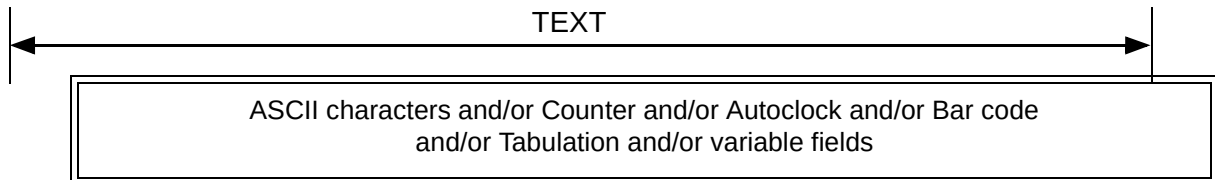
Table 2: Positions of the 5 and 7 point fonts in the printing area.

Fonts name	Position	No
ARA07139	F	063
	G	064
CYR07109	F	066
	G	067
GRE07116	G	069
	F	070
HEB07BAM	F	72
	G	73
IN05_1	C	50
	D	51
IN05_2	C	201
	D	202
IN07_1	F	52
	G	53
IN07_134	F	013
	G	014
OC07_086	F	029
	G	030
SCI05084	C	58
	D	59
SCI07119	F	60
	G	61
SIN05116	C	083
	D	084
SIN5H116	A	166
	B	167
SIN07118	F	52
	G	53
SIN7H118	E	160





5.3 Detail of TEXT

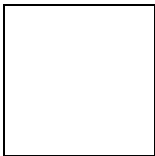


- ASCII characters: keyboard keys.
- Counter: 1Ch (1 byte hexa).
- Autoclock:

Delimiter 1Ah	1 or more elements from the autoclock	Delimiter 1Ah
------------------	--	------------------

Elements of the autoclock:

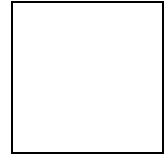
41h = 42 h	second (00 to 59)	(2 bytes ASCII)
43h = 44h	minutes (00 to 59)	(2 bytes ASCII)
45h = 46h	hours (00 to 23)	(2 bytes ASCII)
49h = 4Ah	day of the month (01 to 31)	(2 bytes ASCII)
4Bh = 4Ch 4Dh	day of the year (001 to 366)	(3 bytes ASCII)
4Eh = 4Fh	week of the year (01 to 53)	(2 bytes ASCII)
50h = 51h	month of the year (01 to 12)	(2 bytes ASCII)
52h = 53h 54h	month of the year in letters (JAN to DEC)	(3 bytes ASCII)
55h = 56h	year (00 to 99)	(2 bytes ASCII)
57h = 58h	postday of the month (01 to 31) first postdate	(2 bytes ASCII)



Precise details about the data bytes

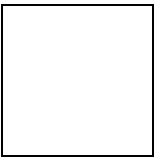
59h	=	postday of the year (001 to 366)	(3 bytes ASCII)
5Ah		first postdate	
5Bh			
5Ch	=	postweek of the year (01 to 53)	(2 bytes ASCII)
5Dh		first postdate	
5Eh	=	postmonth of the year (01 to 12)	(2 bytes ASCII)
5Fh		first postdate	
60h	=	postmonth of the year in letters	(3 bytes ASCII)
61h		(JAN to DEC)	
62h		first postdate	
63h	=	postyear (00 to 99)	(2 bytes ASCII)
64h	=	first postdate	
65h	=	shift code in letter (A to Z)	(1 byte ASCII)
66h	=	shift code in number (01 to 99)	(2 bytes ASCII)
67h			
68h	=	shift code in letters (A to Z –0 –I)	(1 byte ASCII)
69h	=	day of the week in number (1 to 7)	(1 byte ASCII)
6Dh	=	separator: (2 points)	(1 byte ASCII)
6Eh	=	separator / (slash)	(1 byte ASCII)
6Fh	=	separator . (point)	(1 byte ASCII)
70h	=	separator (space)	(1 byte ASCII)

WARNING The hex values of the separators above apply only between 2 autoclock delimiters.



71h	=	postday of the month (01 to 31)	(2 bytes ASCII)
72h		second postdate	
73h	=	postday of the year (001 to 366)	(3 bytes ASCII)
74h		second postdate	
75h			
76h	=	postweek of the year (01 to 53)	(2 bytes ASCII)
77h		second postdate	
78h	=	postmonth of the year (01 to 12)	(2 bytes ASCII)
79h		second postdate	
7Ah	=	postmonth of the year in letters	(3 bytes ASCII)
7Bh		(JAN to DEC)	
7Ch		second postdate	
7Dh	=	postyear (00 to 99)	(2 bytes ASCII)
7Eh		second postdate	

NOTE **All these elements are dissociated (i.e.: last digit of the year = 56h).**



Precise details about the data bytes

• Bar Code

Delimiter 1Fh	Parameters (3 bytes)	BAR CODE CHARACTERS	Delimiter 1Fh
------------------	-------------------------	---------------------	------------------

Detail of the parameter bytes:

1 st byte: Bar code type		0			0	0	0	0	2/5 interlaced
		0			0	0	0	1	Code 39
		0			0	0	1	0	EAN 13
		0			0	1	0	0	1/2 EAN 13
		0			0	1	1	0	EAN 8
		0			0	1	1	1	1/2 EAN 8
		1			0	0	0	0	ITF 14/ITF6
		1			0	0	0	1	EAN 128
		1			0	0	1	0	HIBC
		1			0	0	1	1	UPCA
		1			0	1	0	0	CODE 128
		1			0	1	0	1	UPCE
		1			0	1	1	0	PLANET BAR CODE

↑

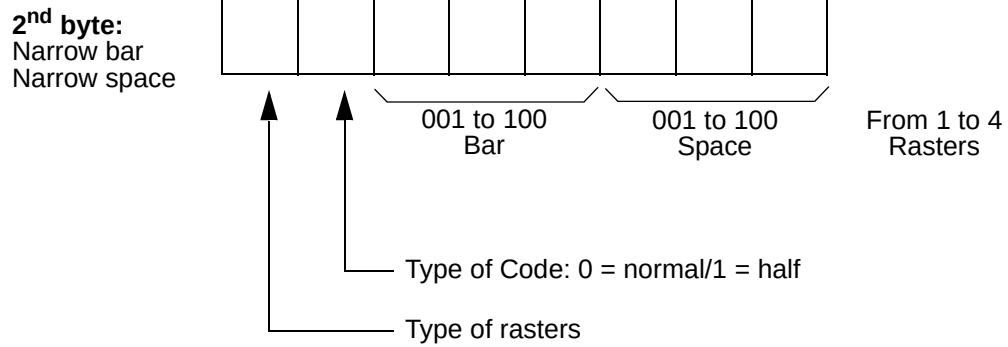
Control byte
0 = no / 1 = yes

↑

Printing type
0 = normal / 1 = video inverted

↑

Coding type
0 = bars / 1 = text

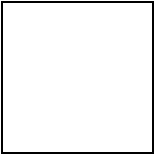


The following table specifies the type of raster as a function of the value of bit7.

The current raster is the full raster of the current generator.

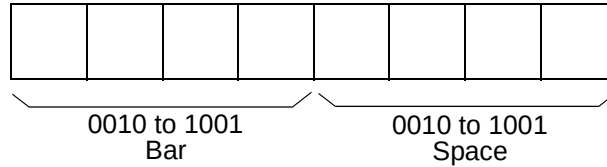
The jet raster is the raster used to connect the jets (on G head printers only).

	BIT7 = 0	BIT7 = 1
CODE 39	Current raster	Jet raster
2/5 INTERLACED	Current raster	Jet raster
HIBC	Current raster	Jet raster
EAN13	Jet raster	Current raster
EAN8	Jet raster	Current raster
ITF14	Jet raster	Current raster
ITF6	Jet raster	Current raster
EAN128	Jet raster	Current raster
CODE128	Jet raster	Current raster
UPCA	Jet raster	Current raster
UPCE	Jet raster	Current raster



Precise details about the data bytes

3rd byte:
Wide bar
Wide space



From 2 to 9
Rasters

Ratio between narrow and wide elements:

A narrow element must be strictly smaller than a wide element.

WARNING

For some bar codes, certain parameters are pre-defined (see printer manual).

Bar Code characters:

Maximum length of a bar code: 32 characters included the control byte.

NOTE

Maximum 4 bar code per message.

- Tabulation:

Delimiter 1Eh	Number of empty raster: 1 to 255 (1 byte hexa)	Delimiter 1Eh
------------------	---	------------------

- Variable fields:

Delimiter 12h	Non-significant ASCII characters (field size)	Delimiter 12h
------------------	--	------------------

6 Logo block/symbol

6.1 Classic printer

Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	 (21h)
---	-----------------------------------	---

- Bolderization: from 1 to 9 on 1 byte hexadecimal.
- Symbol Generator: from 255 to 241 (logo 1: 255, logo 2: 254 ..., logo 15: 241).
The logo must be loaded into the printer to be printed.
(A symbol generator different for each logo).
- The key  (21h) calls as many times as need the logo.

6.2 Master, IP65 and Contrast printers

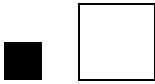
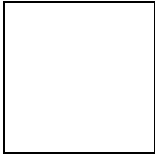
Bolderization from 1 to 9 (1 byte hexa)	Symbol Generator (1 byte hexa)	Symbol Number
---	-----------------------------------	---------------

- Bolderization: from 1 to 9 on 1 byte hexadecimal.
- Symbol generator: No. of font (from 201 to 255).
- No. of symbols in the font:

Symbol No. 1 = 20h
Symbol No. 2 = 21h
etc.

7 Delimiter of end of message

This delimiter 0Dh marks the end of message.



8 General message structures

8.1 General structure of a one-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
OA _h : delimiter of start of line	(1 byte)
Line 1: subdivided into blocks	(from 0 byte if line blank to n bytes)
OD _h : delimiter of end of message	(1 byte)

8.2 General structure of a two-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
OA _h : delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 byte if line blank to n bytes)
OA _h : delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 byte if line blank to n bytes)
OD _h : delimiter of end of message	(1 byte)

8.3 General structure of a three-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
OA _h : delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 byte if line blank to n bytes)
OA _h : delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 byte if line blank to n bytes)
OA _h : delimiter of start of line 3	(1 byte)
Line 3: subdivided into blocks	(from 0 byte if line blank to n bytes)
OD _h : delimiter of end of message	(1 byte)

8.4 General structure of a four-line message

General message parameters	(11 bytes)
Parameters for variable elements	(26 bytes)
OA _h : delimiter of start of line 1	(1 byte)
Line 1: subdivided into blocks	(from 0 byte if line blank to n bytes)
OA _h : delimiter of start of line 2	(1 byte)
Line 2: subdivided into blocks	(from 0 byte if line blank to bytes)
OA _h : delimiter of start of line 3	(1 byte)
Line 3: subdivided into blocks	(from 0 byte if line blank to n bytes)
OA _h : delimiter of start of line 4	(1 byte)
Line 4: subdivided into blocks	(from 0 byte if line blank to n bytes)
OD _h : delimiter of end of message	(1 byte)

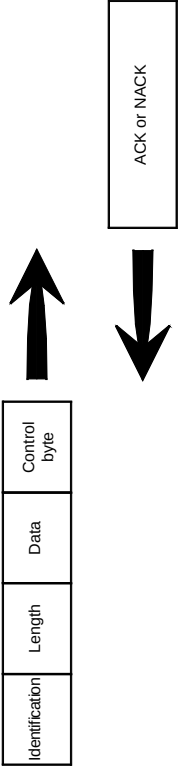
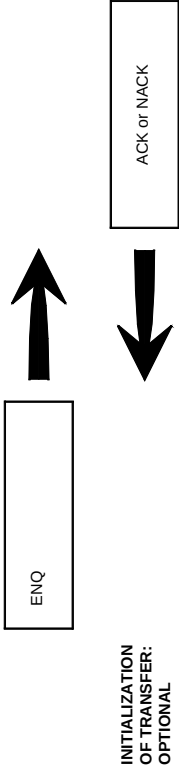
EXAMPLES OF MESSAGE PROGRAMMING

Contents

1	Synoptic - General principle of a V24 exchange	102
2	Synoptic - Sending of a complete message (printer without library)	103
3	Transmission of a one-line message	104
4	Transmission of a two-line message	105
5	Transmission of a three-line message	106
6	Transmission of a four-line message	108

• Data sending from the computer to the printer

CALCULATOR PRINTER



Specific for each command.
See Lists of V24 commands.

Identification (1 byte)

The length is the number of bytes comprised between the length and the checksum byte.

Length (2 bytes)

Zero byte in case of request from the calculator of the printer.
1 byte specifying the jet number in case of a request concerning a jet.
n bytes without specifying the jet number in case of a sending concerning the printer in general.
n bytes following are byte specifying the jet number in case of a sending concerning a jet.

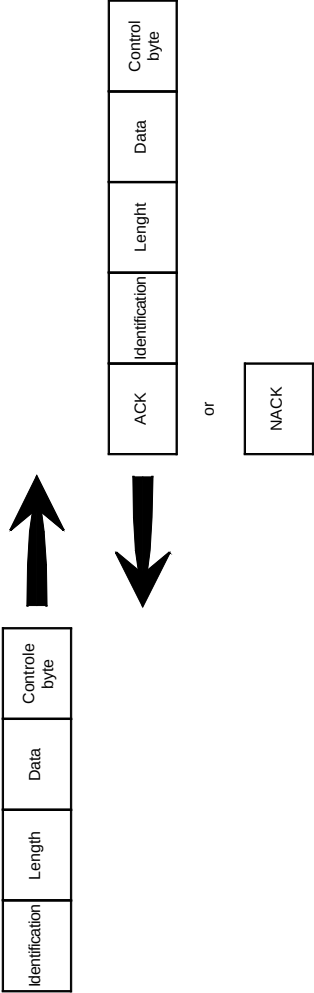
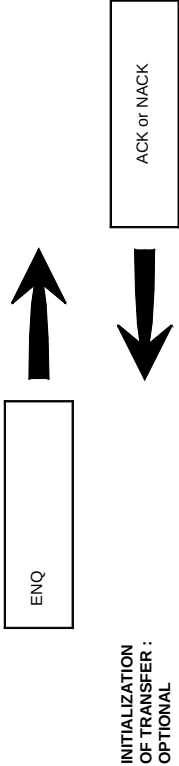
Data (0 to n bytes)

Checksum.
This represent an "OR" exclusive of all preceding bytes (identification, length and data bytes).

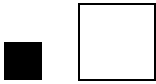
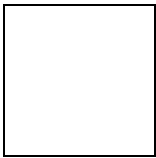
Control (1 byte)

• Data request from the computer to the printer

CALCULATOR PRINTER

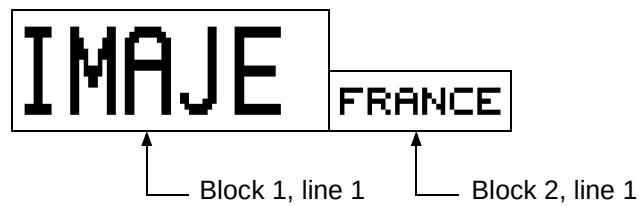






3 Transmission of a one-line message

Without parameters, on jet 1, outside of library, with fonts 16 x 12, No. 56 and 5 x 6 No. 84.

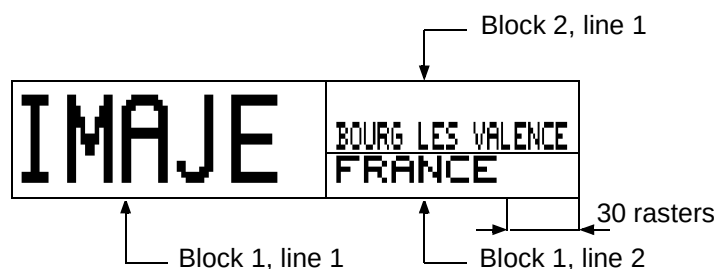


Séquence to be programmed :

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 13h	19 bytes	
Number of jet	01h	jet No 1	
Start of line delimiter	0Ah	line 1	
Bolderization	02h	bolderization 2	Block 1, line 1
Symbol generator	38h	SIN16119 (No 56)	
Text	IMAGE	6 ASCII characters	
Bolderization	02h	bolderization 2	Block 2, line 1
Symbol generator	54h	SIN05116 (No 84)	
Text	FRANCE	6 ASCII characters	
End delimiter	0Dh	end of message	
Checksum	04h	check byte	

4 Transmission of a two-line message

Without parameters, on jet 1, outside of library, with fonts 16x12 No. 56, 5x6 No. 83 and 5x6 No. 84.



WARNING

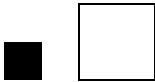
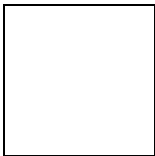
When a message contains two lines, the two lines must end at the same position in order to be printable in "reverse message" direction.

Calculation of the number of balancing rasters for line 2:

Block 2, line 1 = 17 characters x bolderization 1 x 6 rasters/character =	102
Block 1, line 2 = 6 characters x bolderization 2 x 6 rasters/character =	72
Balancing = Difference, i.e.:	30 rasters

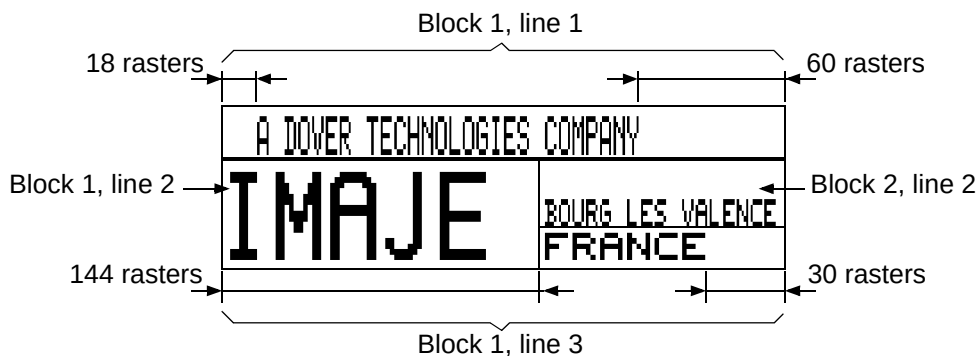
Sequence to be programmed:

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 2Ah	42 bytes	
Number of jet	01h	jet No 1	
Start of line delimiter	0Ah	line 1	
Bolderization	02h	bolderization 2	Block 1, line 1
Symbol generator	38h	SIN16119 (No 56)	
Text	IMAGE	6 ASCII characters	
Bolderization	01h	bolderization 1	Block 2, line 1
Symbol generator	53h	SIN05116 (No 83)	
Text	BOURG ...	17 ASCII characters	
Start of line delimiter	0Ah	line 2	
Bolderization	02h	bolderization 2	Block 1, line 2
Symbol generator	54h	SIN05116 (No 84)	
Text	FRANCE	6 ASCII characters	
Tab delimiter	1Eh	Start tab	
Number of rasters	1Eh	30 rasters	
Tab delimiter	1Eh	End tab	
End delimiter	0Dh	End of message	
Checksum	3Ah	Check byte	



5 Transmission of a three-line message

Without parameters, on jet 1, outside of library, with fonts 16x12 No. 56, 5x6 No. 83, 5x6 No. 84 and 7x6 No. 160.



WARNING

When a message contains more than two lines, all the lines must be of the same length, i.e. have the same number of rasters, in order to be printable in "reverse message" direction.

Calculation of the longest line (line 2):

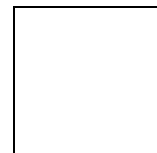
Block 1, line 2 = 6 characters x bolderization 2 x 12 rasters/character =	144
Block 2, line 2 = 17 characters x bolderization 1 x 6 rasters/character =	102
Total line 2 = Block 1 + Block 2 =	246 rasters

Calculation of number of balancing rasters for line 1:

A DOVER ... COMPANY = 28 characters x bolderization 1 x 6 rasters/character = 168 rasters
 Number of balancing rasters = 246 - 168 = 78 raster
 i.e.: 18 rasters in front of the text and 60 rasters after it.

Calculation of number of balancing rasters for line 3:

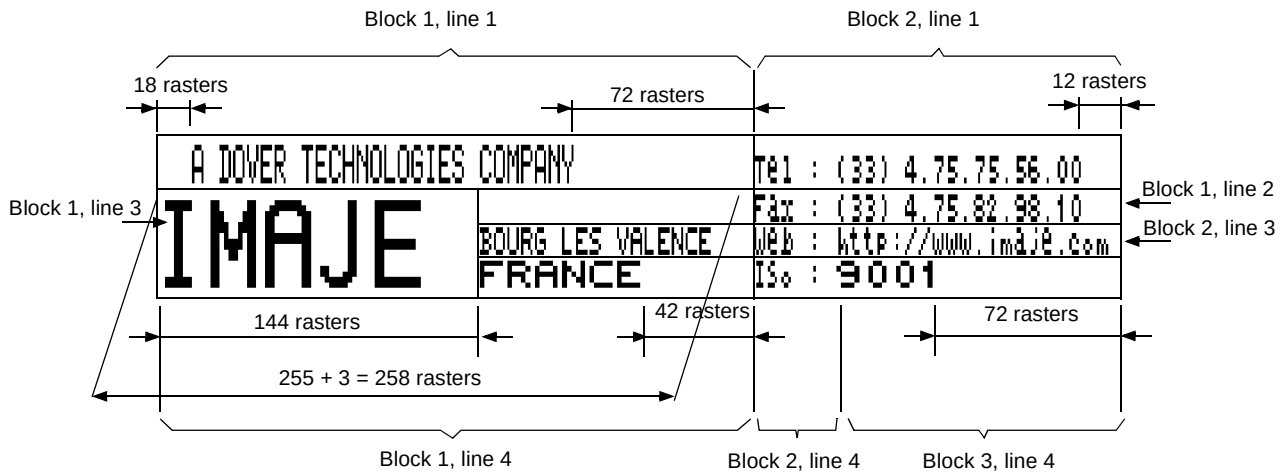
FRANCE = 6 characters x bolderization 2 x 6 rasters/character =	72 raster
Space in front of "FRANCE" = block 1 of line 2, i.e.	144 raster
Number of rasters after "FRANCE" = 246 - (144 + 72) =	30 raster

**Sequence to be programmed:**

Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, 52h	82 bytes	
Number of jet	01h	jet No 1	
Start of line delimiter	0Ah	line 1	
Bolderization	01h	bolderization 1	Block 1, line 1
Symbol generator	A0h	SIN7H118 (No 160)	
Tab delimiter	1Eh	start tab	
Number of rasters	12h	18 rasters	
Tab delimiter	1Eh	end tab	
Text	A...COMPANY	28 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	3Ch	60 rasters	
Tab delimiter	1Eh	end tab	
Start of line delimiter	0Ah	line 2	
Bolderization	02h	bolderization 2	Block 1, line 2
Symbol generator	38h	SIN16119 (No 56)	
Text	IMAGE	6 ASCII characters	
Bolderization	01h	bolderization 1	Block 2, line 2
Symbol generator	53h	SIN05116 (No 83)	
Text	BOURG ...	17 ASCII characters	
Start of line delimiter	0Ah	line 3	
Bolderization	02h	bolderization 2	Block 1, line 3
Symbol generator	54h	SIN05116 (No 84)	
Tab delimiter	1Eh	start tab	
Number of rasters	90h	144 rasters	
Tab delimiter	1Eh	end tab	
Text	FRANCE	6 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	1Eh	30 rasters	
Tab delimiter	1Eh	end tab	
End delimiter	0Dh	end of message	
Checksum	3Bh	check byte	

6 Transmission of a four-line message

Without parameters, on jet 1, outside of library, with fonts 16x12 No. 56, 5x6 No. 83, 5x6 No. 84, 7x6 No. 160, 5x6 No. 166 and 5x6 No. 167.



WARNING

When a message contains more than two lines, all the lines must be of the same length, i.e. have the same number of rasters, in order to be printable in "reverse message" direction.

Example breakdown of message:

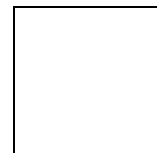
Line1

Block 1: - Space	18 rasters
- Text: A DOVER TECHNOLOGIES COMPANY	168 rasters
- Space	72 rasters
Block 2: - Text: Tel : (33) 4.75.75.56.00	144 rasters
- Balancing	12 rasters
Total line 1	414 rasters

Line 2

Block 1: - Space	255 rasters*
- Space	3 rasters*
- Text: Fax: (33) 4.75.82.98.10	144 rasters
- Balancing	12 rasters
Total line 2	414 rasters

* Since the maximum number of rasters is 255, the space required here (258 rasters) has been divided into two.

**Line 3**

Block 1: - Text: IMAJE	144 rasters
Block 2: - Text: BOURG LES VALENCE Web ... com	270 rasters
Total line 3	414 rasters

Line 4

Block 1: - Space	144 rasters
- Text: FRANCE	72 rasters
- Space	42 rasters
Block 2: - Text: Iso :	36 rasters
Block 3: - Text: 9001	48 rasters
- Balancing	72 rasters
Total line 4	414 rasters

Sequence to be programmed:

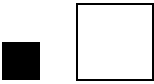
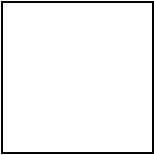
Identifier	0Ah	Transmission of message contents outside of lib.	
Length	00h, C0h	192 bytes	
Number of jet	01h	jet No 1	
Start of line delimiter	0Ah	line 1	
Bolderization	01h	bolderization 1	Block 1, line 1
Symbol generator	A0h	SIN7H118 (No 160)	
Tab delimiter	1Eh	start tab	
Number of rasters	12h	18 rasters	
Tab delimiter	1Eh	end tab	
Text	A...COMPANY	28 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	48h	72 rasters	
Tab delimiter	1Eh	end tab	
Bolderization	01h	bolderization 1	Block 2, line 1
Symbol generator	A6h	SIN5H116 (No 166)	
Text	Tel ...	24 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	0Ch	12 rasters	
Tab delimiter	1Eh	end tab	

Examples of message programming

Start of line delimiter	0Ah	line 2	
Bolderization	01h	bolderization 1	Block 1, line 2
Symbol generator	A7h	SIN5H116 (No 167)	
Tab delimiter	1Eh	start tab	
Number of rasters	FFh	255 rasters	
Tab delimiter	1Eh	end tab	
Tab delimiter	1Eh	start tab	
Number of rasters	03h	3 rasters	
Tab delimiter	1Eh	end tab	
Text	Fax ...	24 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	0Ch	12 rasters	
Tab delimiter	1Eh	end tab	
Start of line delimiter	0Ah	line 3	
Bolderization	02h	bolderization 2	Block 1, line 3
Symbol generator	38h	SIN16119 (No 56)	
Text	IMAGE █	6 ASCII characters	
Bolderization	01h	bolderization 1	Block 2, line 3
Symbol generator	53h	SIN05116 (No 83)	
Text	BOURG...com	45 ASCII characters	
Start of line delimiter	0Ah	line 4	
Bolderization	02h	bolderization 2	Block 1 line 4
Symbol generator	54h	SIN05116 (No 84)	
Tab delimiter	1Eh	start tab	
Number of rasters	90h	144 rasters	
Tab delimiter	1Eh	end tab	
Text	FRANCE	6 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	2Ah	42 rasters	
Tab delimiter	1Eh	end tab	
Bolderization	01h	bolderization 1	Block 2, line 4
Symbol generator	54h	SIN05116 (No 84)	
Text	Iso █ : █	6 ASCII characters	
Bolderization	02h	bolderization 2	Block 3 line 4
Symbol generator	54h	SIN05116 (No 84)	
Text	9001	4 ASCII characters	
Tab delimiter	1Eh	start tab	
Number of rasters	48h	72 rasters	
Tab delimiter	1Eh	end tab	
End delimiter	0Dh	end of message	
Checksum	A5h	check byte	

Contents

1	Introduction	112
2	Characteristics of the Parallel link	113
2.1	Signals transmitted by the Parallel link	113
2.2	Characteristics of transmitted levels	113
3	Connection diagram	114



1 Introduction

The Parallel interface allows rapid selection and printing of a message stored in the library.

The options "Message selection" and "Message library" are necessary for using this mode of operation.

The machine screen is not refreshed in this mode.

2 Characteristics of the Parallel link

2.1 Signals transmitted by the Parallel link

- 8 data input signals (D0 to D7) which enable the selection of the number of the message to be printed.
- 1 input signal, called "DTOP", which enables the validation of the active message number in the memory and starting-up of printing.
- 1 output signal, called "BUSY", which indicates that printing has started.

NOTE	The input/output signals being photocoupled on the Industrial Interface card each require an electrical reference wire (see Chapter 3 of present Section).
-------------	---

2.2 Characteristics of transmitted levels

- The active level (logic 1) is comprised between 9 and 24 volts D.C.
- The inactive level (logic 0) is comprised between 0 and 2 volts D.C. (see Figure 1).
- The current admissible on input is comprised between 9 mA and 25 mA.
- The input frequency must not exceed 10 kHz.

Figure 1 : Authorised voltage level

-
- | | |
|----------|--------------------------|
| 1 | Active level (logic 1) |
| 2 | Anactive level (logic 0) |
-

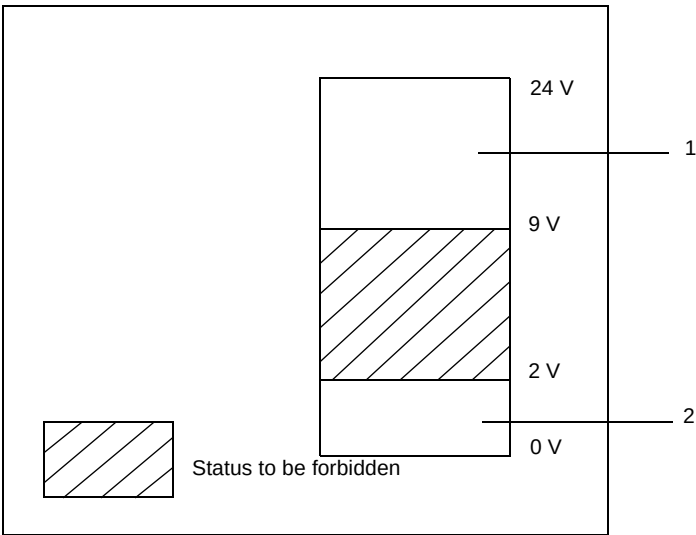
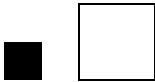
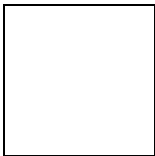


Figure 1



3 Connection diagram

To have access to the Industrial Interface card, unscrew the two fixing screws of its compartment housing at the rear of the printer.

Pass the connecting cable through one of the grommets and fix the wires to the corresponding terminals.

B2/IMP1 and B3/IMP2 terminal block

1	GND	0 VA	Analog 0 V
2	+ 24 T	+ 24 VE	+24 V supply not insulated galvanization
3	CTP	DTOP-	Terminals for connection of the object detection cell
4	TP	DTOP+	
5	CVI	VALIMP-	Inhibition of the object detection signal
6	VI	VALIMP+	
7	CTH	TACHY-	Terminals for connection of the tachometric generator
8	TH	TACHY+	
9	TH+	TACHY+	Terminals for connection of a differential tacho generator
10	TH-	TACHY-	
11	C BU	BUSY-	Output for printing start-up signal
12	BU	BUSY+	
13	C D	DATA (-)	Commun DATA (-)
14	D0	DATA (+) 8 bits	Inputs for Parallel interface printing used in "Message selection".
15	D1		
16	D2		
17	D3		
18	D4		
19	D5		
20	D6		
21	D7		
22	+ 24 T	+ 24 VE	+ 24 V supply not insulated by galvanization

The input/output of the Parallel interface are photocoupled.

Wiring example: object detection

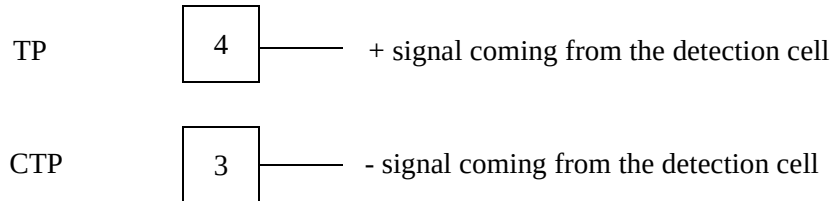


Figure 1 : Diagram of a photocoupled input

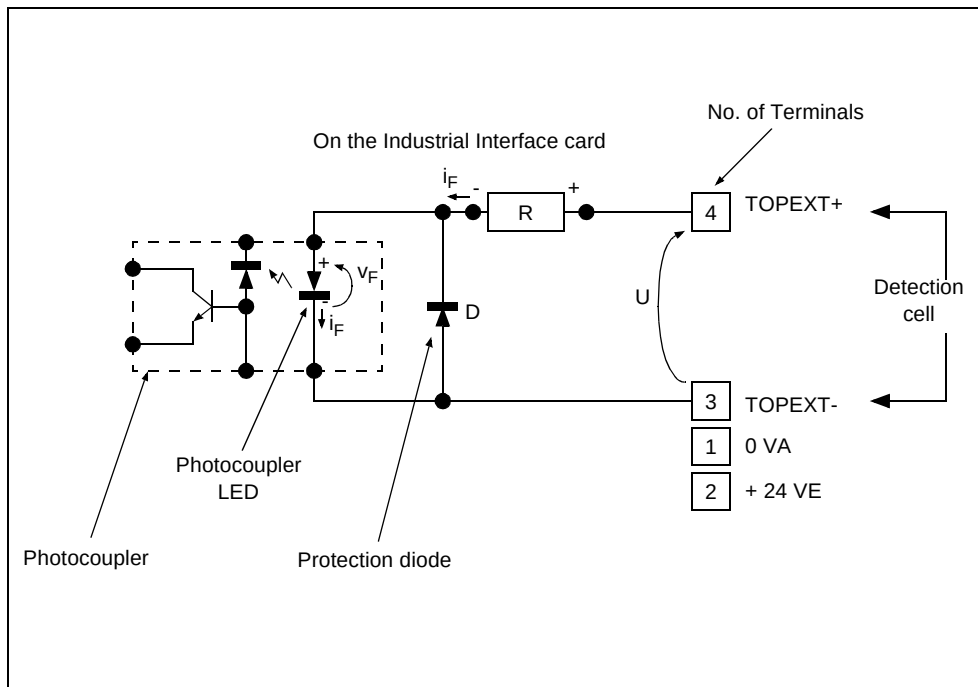
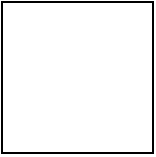


Figure 1

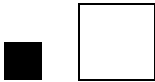
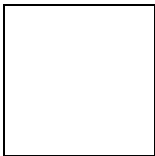
The emitted signal must be positive in relation with its earth.



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Contents

1	Selection of a message from the library	118
1.1	Encoding of message number in BCD format	118
1.2	Encoding of message number in hexadecimal mode	119
1.3	Option: reversed message direction	119
2	Input signals diagram	120
3	Master jet, master message	122
4	General operation of the parallel interface	123
5	Restriction of the parallel interface operation	123
6	Usage according to printer configurations	124
6.1	Printer 1.1 (1 single-jet print head)	124
6.2	Printer 1.2 (1 twin-jet print head)	124
6.3	Printer 2.1 (2 single-jet heads)	125
6.4	Printer 2.2 (2 twin-jet heads)	125
6.5	Printer 1.4 (1 head with 4 jets)	126
7	Summary charts	127
7.1	General	127
7.2	Special case	127



1 Selection of a message from the library

The signals D0 to D7 (which represent one byte of 8 bits) indicate the number of the active message to be printed and its type of coding.

The number of addressable messages in the library is variable (from 1 to 79 in decimal format, from 1 to 4F in hexadecimal format). It depends on the value displayed in the   function in the case of Classic or in the menu Production, Message, Library in the case of Master, IP65 and Contrast.

Validation and printing of the new message are performed by sending the DTOP signal.

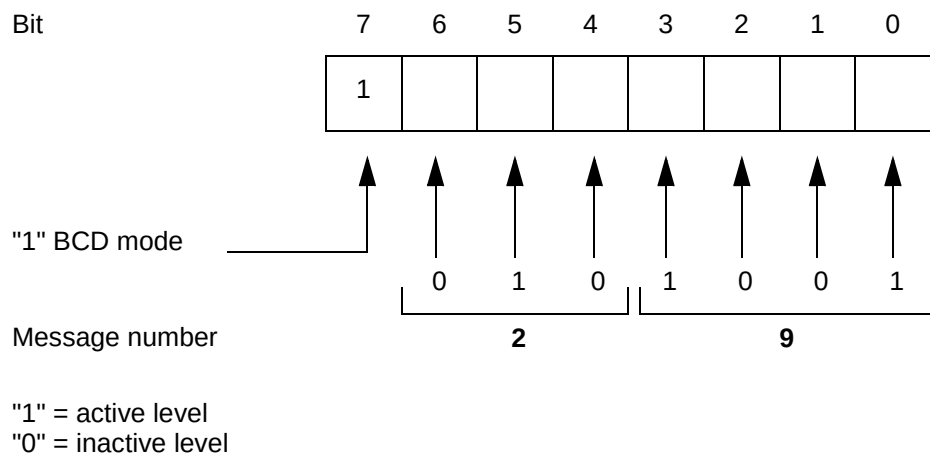
Possible types of encoding for the message number: there are 3 possibilities.

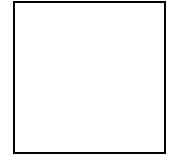
1.1 Encoding of message number in BCD format

The BCD mode (Binary Coded Decimal, base 10) uses 4 bits, whose value is comprised between 0 and 9 (from 0000 to 1001 in binary code).

The units in the message number are represented by the bits 0, 1, 2 and 3.
The tens in the message number (from 0 to 7) are represented by the bits 4, 5 and 6.
Bit 7 must **obligatorily** be positioned at 1.

Example: request of message number 29.





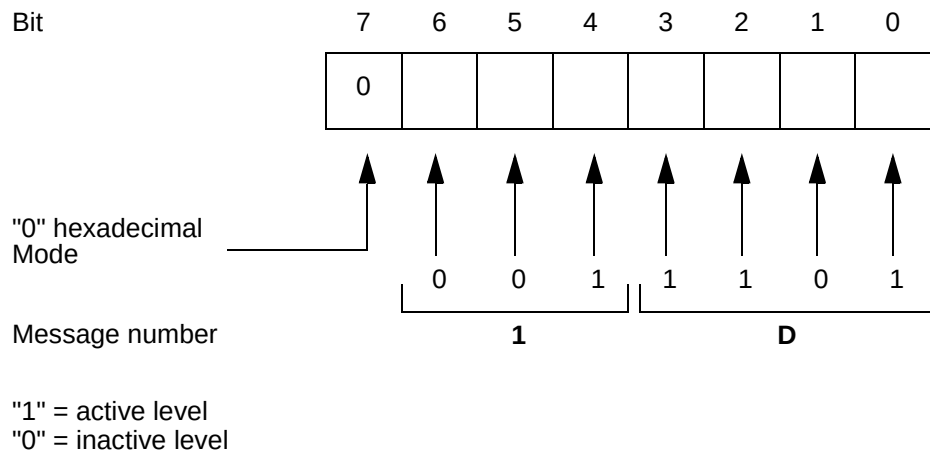
1.2 Encoding of message number in hexadecimal mode

The hexadecimal mode (base 16) is coded on 4 bits, whose value is comprised between 0 and F (0000 and 1111 in binary code).

Bits 0 to 6 used for the message number.

Bit 7 must **obligatorily** be positioned at 0.

Example: request for message number 29 (1D in hexadecimal).



1.3 Option: reversed message direction

If the printer is equipped with the "reverse message direction" option, the message number must be encoded in hexadecimal format.

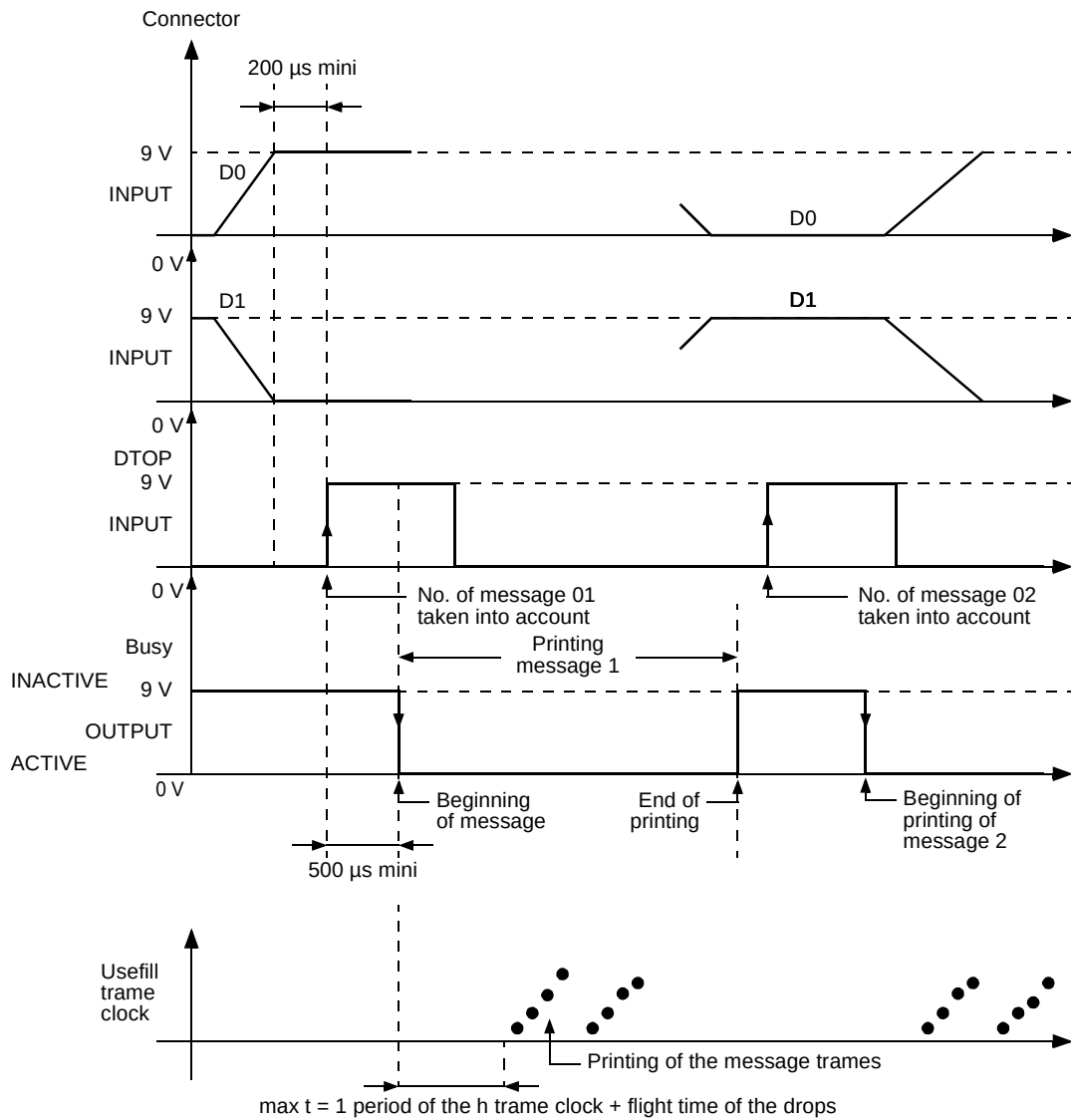
Bit 7 is used to reverse the direction of message printing.

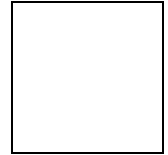
0 = normal direction / 1 = reverse message direction.

2 Input signals diagram

- Selection of message 1: number 1
- Selection of message 2: number 2

The data bits 2 to 7 are at 0.



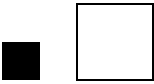
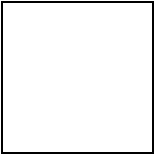


The minimum time between the stable signals D0 to D7 and the DTOP is 200 μ s.

The DTOP signal may drop out as soon as the BUSY signal is active.

The minimum activation time of the BUSY signal after a DTOP is 500 μ s.

The BUSY signal remains active during the full printing time of the message. It becomes inactive again as soon as the printer is available for a new message.

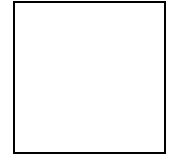


3 Master jet, master message

As a general rule, the "master jet" is jet number 1 of a print head.

Master messages are associated with master jets and their numbers advance by 1 in 1, 2 in 2 or 4 in 4, according to the printer configurations.

In practice, when the message is composed on the printer keyboard the master messages are those for which one can access to "message parameters".



4 General operation of the parallel interface

To print a message from the library, it is necessary:

- To present the message number to printer on the Parallel Interface (D0-D7) of the head concerned.
- To activate the DTOP signal, which:
 - memorizes the message number,
 - activates the print start-up.

The BUSY signal is activated at the start of printing. It becomes inactive at the end of the printing cycle.

A printing cycle consists of:

- a print of the message,
- phase recognition.

When the Parallel Interface is used in AUTO mode, the BUSY operates as described above for each message printed.

It can therefore be used to after the message itself in this start mode.

If the printer receives a DTOP without the external inputs being activated, the last selected message is to be printed.

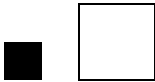
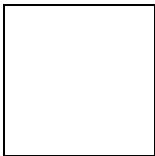
If the printer receives an invalid message number the last selected message is to be printed.

A message number should be from 1 to the end of the library.

Any message beyond the size of the library is invalid.

5 Restriction of the parallel interface operation

- The option "Non double printing" is not available with the option "Message selection".
- The use of postdate 2 is incompatible with the use of a parallel interface option.



6 Usage according to printer configurations

6.1 Printer 1.1 (1 single-jet print head)

- **Branching:**

Head 1 → D0-1 to D7-1, Dtop 1, BUSY 1

- **Usage:**

All the messages are "masters" and can be allocated to the single jet.

WARNING

The message number must not exceed the size of the library.

6.2 Printer 1.2 (1 twin-jet print head)

- **Branching:**

Head 1 → D0-1 to D7-1, Dtop 1, BUSY 1

- **Usage:**

Only odd numbered messages are "masters".

The message number to be presented to the parallel Interface must be that of Jet 1.

Jet 2 automatically and necessarily assumes the following message number.

Example:

Jet 1, "master" message Nr n (odd)

Jet 2, message (n + 1)

WARNING

(n + 1) must not exceed the size of the library

- **Library storage:**

Message 1 jet 1

Message 2 jet 2

Message 3 jet 1

Message 4 jet 2

Message 5 jet 1

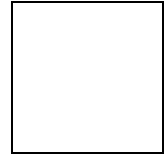
•

•

•

Message 77 jet 1

Message 78 jet 2



6.3 Printer 2.1 (2 single-jet heads)

- **Branching:**

Head 1 → D0-1 to D7-1, Dtop 1, BUSY 1
 Head 2 → D0-2 to D7-2, Dtop 2, BUSY 2

- **Usage:**

All the message are "masters" and can be used indifferently on both heads provided they have the same character generators.

Otherwise:

Message 1	head 1
Message 2	head 2
Message 3	head 1
Message 4	head 2
Message 5	head 1
.	
.	
.	
Message 79	head 1

6.4 Printer 2.2 (2 twin-jet heads)

- **Branching:**

Head 1 → D0-1 to D7-1, Dtop 1, BUSY 1
 Head 2 → D0-2 to D7-2, Dtop 2, BUSY 2

- **Usage:**

Only the odd numbered messages are masters. The message number to be presented on the parallel Interface must be that of Jet 1 of the corresponding print head.
 Jet 2 of the same head then automatically and necessarily assumes the following message number.

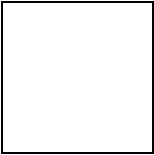
Example:

Jet 1, "master" message Nr n (odd)
 Jet 2, message (n + 1)

WARNING (n + 1) must not exceed the size of the library.

- **Library storage:**

Message 1	head 1 jet 1 (master message)
Message 2	head 1 jet 2
Message 3	head 2 jet 1 (master message)
Message 4	head 2 jet 2
Message 5	head 1 jet 1 (master message)



6.5 Printer 1.4 (1 head with 4 jets)

- **Branching:**

D0-1 to D7-1, Dtop 1 and BUSY 1

D0-2 to D7-2, Dtop 2 should be branched parallel with D0-1 to D0-7 and Dtop 1.

- **Usage:**

The message number to be presented on the parallel Interface for the head is that of Jet 1 of the corresponding head.

Jet 2 automatically assumes the message number on the basis of that of jet 1.

Jet 3 automatically assumes the message number on the basis of that of jet 2.

Jet 4 automatically assumes the message number on the basis of that of jet 3.

Example:

Jet 1, message n (master message)

Jet 2, message n + 1

Jet 3 message N + 2

Jet 4 message n + 3

WARNING

(n + 3) must not exceed the size of the library.

BUSY 1 is activated if the 4 jets are printing.

- **Library storage:**

Message 1 jet 1 (master message)

Message 2 jet 2

Message 3 jet 3

Message 4 jet 4

Message 5 jet 1 (master message)

.

.

.

Message 73 jet 1 (master message)

Message 74 jet 2

Message 75 jet 3

Message 76 jet 4

7 Summary charts

7.1 General

Messages are:

- created by the operator Interface (machine keyboard),
- selected by the parallel Interface.

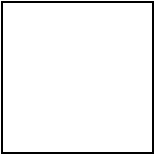
	Printer	1.1	1.2	2.1		2.2		1.4
	Head	1	1	1	2	1	2	1
	Master jet	1	1	1	3	1	3	1
Master message	n	01 02 03...79	01 03 05...77	01 03 05...79	02 04 06...78	01 05 09...73	03 07 11...75	01 05 09...73
Automatically associated messages	n + 1		02 04 06...78			02 06 10...74	04 08 12...76	02 06 10...74
	n + 2							03 07 11...75
	n + 3							04 08 12...76

7.2 Special case

Message are:

- created by the series Interface (V24 connection),
- selected by the parallel Interface.

Printer	1.1	1.2	2.1		2.2		1.4
Master message	x	x	x	x	x	x	x
Value of x	$1 \leq x \leq 79$	$1 \leq x \leq 78$	$1 \leq x \leq 79$		$1 \leq x \leq 78$		$1 \leq x \leq 76$
Message Nr on jet 2		x + 1			x + 1	x + 1	x + 1
Message Nr on jet 3							x + 2
Message Nr on jet 4							x + 3



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REVISION

Update to instruction manual "RS232 link - parallel link"

- The revision index A0 corresponds to the first edition of this manual.
- The revision index changes with every modifications.
The modified pages are mentioned in the following table. This one indicates all updating since the first edition.

Date of edition	Document revision index	S8 range Software index	Modified pages
01/ 2002	A0	D8x/A8x	Initial edition
11/2002	B0	D8x/A9x	2, 9, 13, 39, 68, 96, 104, 129, 130.

Photos and diagrams not contractually binding. Photos: GINKO. X



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